User's Guide™

THE MAGAZINE FOR CP/M COMPUTER USERS

No. 17

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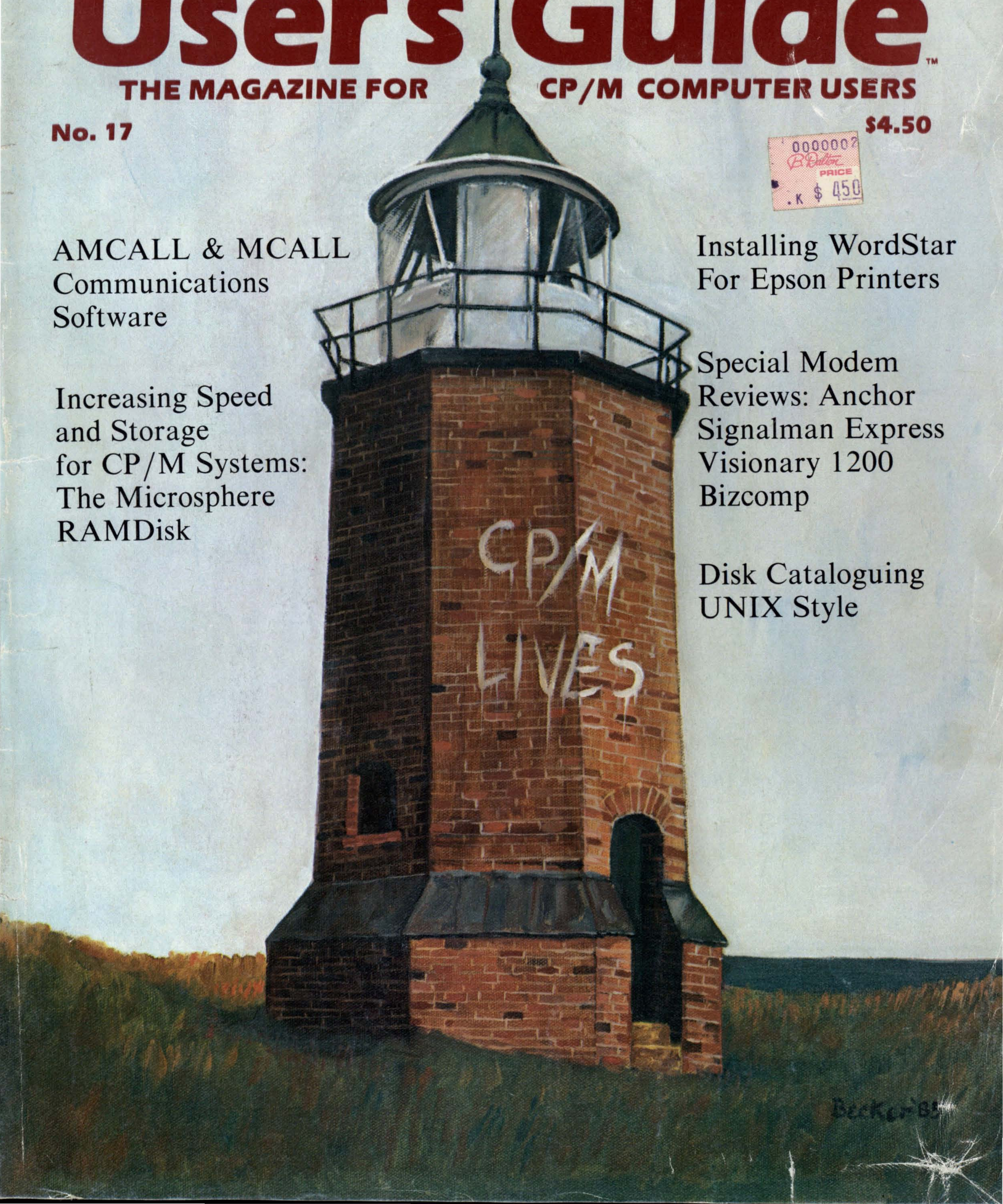

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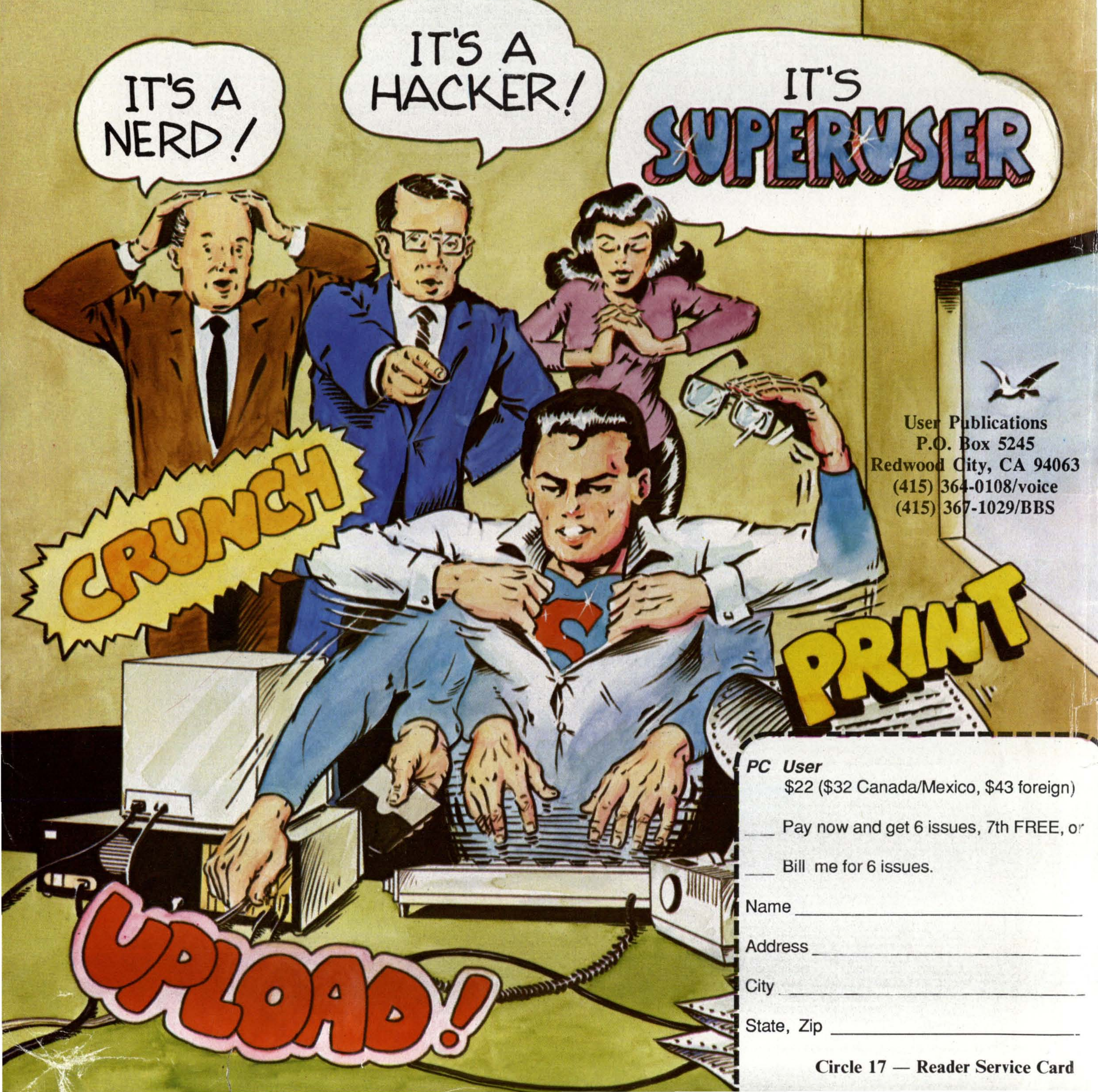
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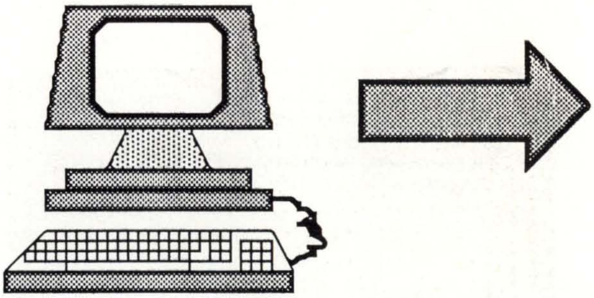

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Need local variables that retain their values between procedure and function calls? How about automatic variable initialization, or accessing components of a string constant?

Typefaces

We use **`this Typeface`** to show commands and expressions you type at your keyboard, and `this typeface` to show displayed messages.

In summaries we use *italics* along with **`this Typeface`** to show optional parts of commands and expressions. Keywords are usually in UPPER case letters, with your words and data in Upper/lower case.

We also use the symbol ↵ to represent the standard Return key (CR or ENTER on some keyboards), and the caret symbol ^ to represent the Control key (CNTL, CTRL or ALT on some keyboards).

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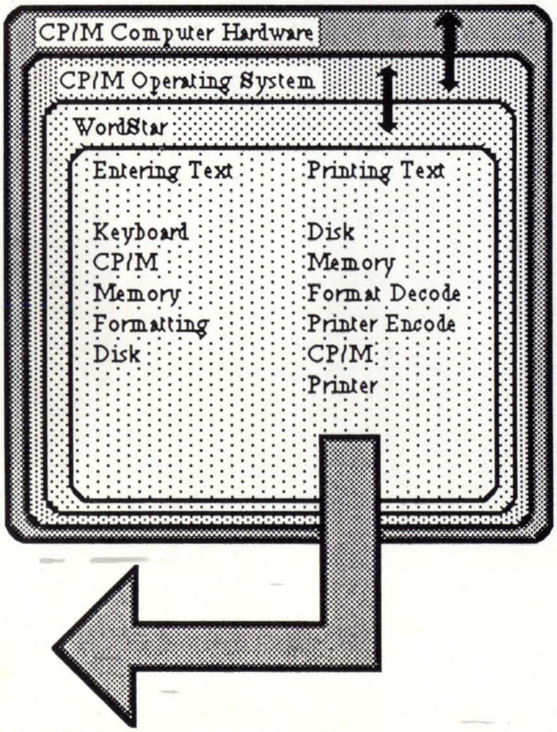
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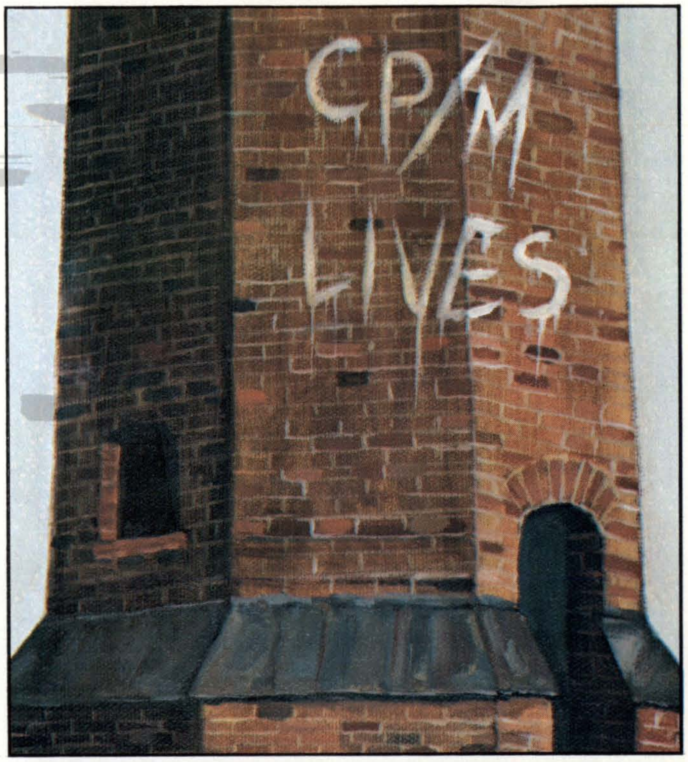

Cover by Rick Becker, based on Klaus Moritz, "The Lighthouse" (Holland, 1955).

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by Byron McKay

A lot of bang for a lot of buck, from the inventors of intelligent modems.

Z80 Visionary 1200 Intelligent Modem 26

by Tony Bove & Cheryl Rhodes

It can automatically dial stored phone numbers, receive and store messages, send/pick up your electronic mail, and emulate telex, without involving you or your computer.

An Empire Founded on CP/M

Look out, Gulf + Western!

"We are all in the gutter,
but some of us are looking at the stars."
— Oscar Wilde

First the good news: *User's Guide* is returning to an all-CP/M magazine, and we are starting a magazine called *PC User* to handle PC-compatible users. We hope this winning combination, together with our new magazine *Desktop Publishing*, will generate enough new business to allow us to continue to publish the best articles and most useful tutorials we can find.

Now the bad news: we aren't getting enough sleep. We wear more hats around the office than the Madhatter of San Francisco's Schlock Shop. If this goes on too much longer we'll collapse under our Compupros and Kaypros.

We need all our readers to continue supporting the magazines as we go through difficult yet highly-promising times. Our commitment to CP/M is now enhanced, yet we cannot survive without new subscribers and renewals. So far our renewals have been fantastic, demonstrating that the magazine continues to be useful (at least to those who already read it). We want it to be useful to *more* people, and so we ask your help: please help us find new subscribers. Then we can get some sleep.

The CP/M market seems already asleep, but a peak under the covers reveals a healthy market segment actively engaged in using microcomputers in business and professional applications. They are looking for new hardware, especially peripherals, and they want to upgrade to more sophisticated software in many of their applications. In other applications, they are perfectly satisfied with software *that works* and has worked for many years.

CP/M lives on in the hearts and minds of those who use it. Forgotten by the media, by manufacturers, by software publishers and by industry investors, it nevertheless continues to serve those who find it useful. CP/M is a cohesive software base that brings a world of proven business and professional software to the users of a variety of inexpensive machines. It means a stabilized software universe — machines that won't be updated into incompatibility, and software that has already been tested and thoroughly debugged through years of widespread use.

When the CP/M market was as overexcited as the PC market is today, there was an unprecedented boon in "cottage industry" software sales. The small software publishers were publishing programs that solved very specific problems, and the term "vertical market software" came into vogue. Marketers realized that the major factor in selling computers to people who had never used them before was to show them useful applications they could understand — like bookkeeping, business management, stock market watch & portfolio analysis, electronic banking and shopping, electronic mail, and electronic publishing.

The dust has settled in the CP/M market, and the new products that *are* available are for the most part innovative and useful, and represent another evolution of software development. The tools for programming in a CP/M environment are well-honed and readily available, and as a result the quality of CP/M application software has steadily improved over the years.

CP/M users are now focusing on new and different applications, and learning how to get more out of their investment. Cynics that stashed their CP/M computers in the closet and bought IBM PCs are right that the market has swung in that direction, but they are also plagued with a noisier marketplace filled with clone products, many of which are excellent but only discovered after you've overspent your software budget. I hate to quote Oscar again, but he's right: cynics know the price of everything and the value of nothing.

Continued on page 59

EXTRA . . . EXTRA . . .   EXTRA . . . EXTRA . . .

According to leading publications, the PC market is in the midst of a fullblown shakeout. IBM, KAYPRO, OSBORNE and most other PC manufacturers are initiating cutbacks and layoffs due to slumping sales. Their increasing advertising dollar brings less & less results. At the same time sales for the ZORBA portable computer, the computer that is only advertised in a few choice periodicals and relies heavily on satisfied user testimonials, are showing a steady increase.

It's no secret, the public is learning what industrial users have known for years. That is: that for daily operation of wordprocessors, spreadsheets and databases, the trendy options are rarely used and the flashy machines that house them are really no faster, no more reliable and much more expensive.

THE PUBLICS LEARNING WHY THE ZORBA IS STILL AND ALWAYS HAS BEEN THE EXPERTS CHOICE.

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PORTABLE COMPUTER

FEATURES:

- 9" GREEN OR AMBER CRT
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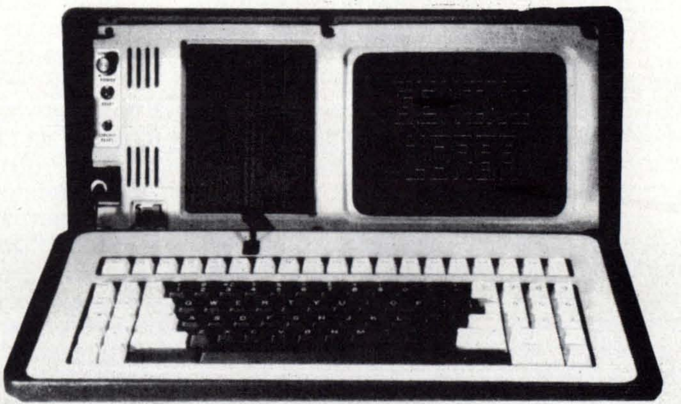

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General Specifications

ZORBA is the lowest cost full featured portable computer. This light weight computer is ruggedly packaged in a convenient carrying case. The case surrounds a strong inner chassis which further protects the Z80A based computer with its two double sided double density disk 400K drives, large easy to read 9" display screen and well designed detachable keyboard.

ZORBA uses CP/M, the industry standard operating system, which means that a wide range of existing software is readily available to the user.

The ZORBA users manual covers operation of the unit, all suppllied software and all interface and internal information. A system diskette is supplied with all system files and utilities. A second diskette contains the sources for all ZORBA software including BIOS, SETUP, FORMAT, and PATCH.

Keyboard

Keyboard communicates serially with CPU
Detachable with 2 foot coiled cord
95 keys in standard QWERTY format
13 Key Numeric pad
Independent Caps Lock and Shift Lock
55 Software programmable function keys
All keys auto-repeat after 1 second delay
All Standard cursor and terminal control keys

Disk System

Controller:	WD1793
Drives:	5.25 Double Sided, Double Density, 400K 48 TPI

Built-in disk interchange formats: Xerox 820 (SD, DD), Kaycomp (DD), DEC VT-180 (SD), Osborne (SD) and IBM-PC (eg. CPM/86) and Televideo 802 (Read/Write and Format compatibility) (Expandable to 82 Formats)

Specifications
General Mechanical and Electrical

Width	-17.5 inches (44.45 cm)
Height	- 9.0 inches (22.86 cm)
Depth	-16.0 inches (40.64 cm)
Weight	-24.6 pounds (11.1 Kg)
Power	-80-130 VAC or 190-245 VAC 50/60 Hz 170 watts max

Display

Display Tube:
9" diagonal, Green or Amber
High resolution display circuitry
60 Hz refresh rate

Display Format:
25 lines x 80 columns
5x7 Character Font with full descenders
128 ASCII Characters
8x9 32 Characters Graphic Font
2K Memory Mapped Display Buffer

CPU Board

Z80A CPU running at 4 Mhz with no wait states
64K bytes of 150 ns RAM (58K after CP/M loaded)
16K bytes of EPROM (2732) can be switched in and out by software 12K available for user EPROMS
8275 CRT controller, DMA driven
1793 Floppy disk controller, SMC data separator
Bipolar proms configure 10 addresses
Fully structured interrupts prioritized by bipolar proms

Interfaces

- Full asynchronous RS232 port with modem control. Baud rates and data translation and protocol programmable
- Full asynchronous full duplex RS232 port with hardware handshake (for printers). Baud rates and protocol programmable. (Serial Printer Port)
- One 8 Bit parallel port with independent strobe and ready lines. Supports Centronics interface with an available adaptor cable.
- IEEE 488 Bus Master Port (ie: General Purpose Instrumentation Bus) not Software Supported.
- 21 Standard Software Programmable Baud Rates: 45.5 to 19,200 BPS

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A good example of our ***CP/M Difference*** program is the Certified Software Accounting System. It's professional quality software with features that make it suitable for any business from a one-person part timer to a medium sized corporation. This system originally sold for over $1000. Our special price is only $149.95! ($249.95 in MS-DOS). Demo Disk - $5.00.

The Certified Software Accounting System is certified by the big-eight accounting firm of Touche-Ross to meet Generally Accepted Accounting Principles and provide required audit trails for business use. Certification was expensive, but to you it means this is an accounting system you can trust.

One really great feature is that this software interfaces with your spreadsheet, database system and word processor. You can send data to SuperCalc and most other spreadsheets—with all labels and figures right where they make sense, ready for you to use in business analysis. Sending data to your word processor means you can add accounting data to reports without retyping—reducing the likelihood of errors.

Our three module package includes General Ledger, Accounts Payable and Accounts Receivable. Inventory and Payroll modules can be added for $74.95 each ($99.95 in MS-DOS). General Ledger only is available for $99.95 ($149.95 MS-DOS)

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General Ledger - Journal, Trial Balance, Account Balances, Accounts by Department, Income Statement, Balance sheet, Chart of Accounts, Spreadsheet Transfer.

Accounts Payable - Audit Report, Cash requirements, Unpaid invoices by Vendor, Checks, Check Register, Distribution Summary, History Report, Vendor List, Vendor Summary.

Accounts Receivable - Journal, Ledger, Delinquent Accounts, Distribution Summary, Customer Statements, Customer List, Customer Label.

Inventory - Stock Status, Inventory Activity, Reorder Notices, Price List, Sales by Class, Sales by Item, History by Type, History by Item.

Payroll - Payroll Distribution, Checks, Check Register, Deduction Worksheet, Accumulation Report, Distribution Summary, Employee Roster, Employee Earnings, Quarterly Report.

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Footnote- Footnotes make your work look pro and read better. But what a pain! **Footnote** makes it easy. Automatic updates after editing, even tracks internal cross references. Previously $99.95, now only $59.95!

Bibliography - Wonderful for professionals. Maintain a library of references in your field. Bibliography merges selected references into a beautifully formatted and referenced bibliography, complete with cross references and multiple citations. Was $94.95, now only $59.95

Spell - Our favorite spelling checker. No bells and whistles, just a fast checker that fits on a SSDD disk with WordStar. (Like most tools, if it's not handy, you won't use it.) Spell is super, and it's always been a bargain at $49.95

Notebook - A practical freetext data base that combines the speed and power of a field oriented system with the convenience of a word processor. A bonus: Use Notebook like an automated 3X5 card file, then transfer references to Footnote and Bibliography. The files interchange! Notebook was $149.95, our special price is now only $69.95!

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Communicating With AMCALL and MCALL-II

Two modem and communications programs, supplied free with CompuPros and Osbornes, are also available for other computers.

by Jonathan Sachs

AMCALL and MCALL-II are communication programs for computers that run CP/M-80, CP/M-86, and related operating systems. With their aid, you can:

- Use your computer as a terminal to communicate with a timesharing service such as CompuServe or The Source.
- Establish communication between your computer and another near-by computer, using a cable connected to a serial port on each system.
- Record your computer's incoming data in a file, and send data from one of your computer's files to another computer.
- Transfer entire files between two computers in both directions, even if those files contain data that cannot be entered through a keyboard or displayed on a screen. This is a convenient way to transfer programs and other files between computers that cannot read each other's disks.

AMCALL and **MCALL-II** are from MicroCall Services, 9655-M Homestead Court, Laurel MD 20707. The communication programs run under CP/M-80 and CP/M-86 with multi-user versions for MP/M-86 and Concurrent DOS. Phone: (301) 776-5253.

Confused Yet?

If you have no prior experience with communication programs, you're likely to find this tutorial heavy going. You'll encounter many terms that are unfamiliar, like "modem" and "serial interface parameter."

To get the background you need to use a communication program, see the December 1983 issue (#6) of *User's Guide*. This issue contains several articles that will help you get oriented:

- "For Starters... Communications" (p.4) discusses the points to be considered in choosing a communication program.
- "Making Connections" (p.21) explains the "serial interface" that most computers use to communicate with each other.
- "Glossary... Computer Communications" (p.26) defines the terminology that you must use to deal with computer communications.

Why AMCALL and MCALL-II?

AMCALL and MCALL-II are similar in function to other communication programs such as MODEM6, MODEM7, and PC-TALK III. Several of these other programs are better known and more widely used than AMCALL and MCALL-II. Why, then, should you consider using AMCALL or MCALL-II? There are several possible reasons.

First, AMCALL and MCALL-II are available for many computers that run CP/M-80 and CP/M-86. With a single exception, PC-TALK III is available only for the IBM PC and PC-compatible systems running PC DOS or MS DOS. (The exception is Concurrent PC DOS, a relative of CP/M-86 that runs on the IBM PC. Concurrent PC DOS includes a version of PC-TALK III called DR-TALK.)

Another reason is that AMCALL and MCALL-II are sold pre-configured for a specific computer. (AMCALL also is pre-configured for a specific modem). In most cases, programs in the MODEM family (MODEM6, MODEM7, etc.) require modification to run with a particular computer and modem. This modification requires some technical knowledge.

If you have an Osborne 1 or Osborne Executive Computer with a COMM-PAC modem, you have another reason: you received AMCALL along with the modem. If you have a Viasyn (CompuPro) computer with the Concurrent CP/M 8-16 or Concurrent DOS 8-16 operating system, you got AMCALL and MCALL-II along with the operating system.

Finally, AMCALL and MCALL-II have features that many other communication programs lack, particularly for automating telephone dialing and file transfers.

There are also a couple of reasons why you might *not* want to use AMCALL or MCALL-II. Unlike PC-TALK III and many versions of MODEM, AMCALL and MCALL-II are not public-domain or freeware programs. They are products of MicroCALL Services, and are licensed for use on one computer system at a time. Also, AMCALL and MCALL-II are somewhat more difficult to learn to use than many other communication programs.

The major difference between them is that AMCALL supports auto-dialing while MCALL-II does not. AMCALL also supports auto-answering.

AMCALL or MCALL-II?

AMCALL and MCALL-II are identical in most ways. The major difference between them is that AMCALL supports *auto-dialing*, while MCALL-II does not. That is, AMCALL can dial another computer's phone number itself. AMCALL also supports *auto-answering*, which means that AMCALL can wait for another computer to call yours, then "answer the phone" and communicate.

Since auto-dialing and auto-answering require AMCALL to send special "dial" and "answer" commands to your modem, AMCALL works only with specific types of modems. At present, AMCALL supports these modems:

- The Potomac Micro-Magic MM-103, a modem built into a board for S-100 computers.
- The D.C. Hayes MICROMODEM-100, also built into a board for S-100 computers.
- The COMM-PAC modem sold by Osborne Computer Company for the Osborne 1 and Osborne Executive computers.
- The D.C. Hayes SmartModem 300 and 1200, which attaches to any computer with a standard RS-232C (serial) interface.
- Other serial interface modems that use the same commands as the Hayes SmartModems, such as the U.S. Robotics AUTO DIAL 212A.

AMCALL is more convenient to use than MCALL-II — as long as you are using one of the modems it supports. But you must choose MCALL-II if you do not have a modem supported by AMCALL, or if you are communicating with another computer through a cable, not through a modem and telephone circuit.

You can use both AMCALL and MCALL-II on the same system. For example, you can use MCALL-II to communicate between two computers connected by cable, and also use AMCALL to communicate with distant computers by modem.

Some Terminology

It's awkward to say "AMCALL and MCALL-II," and since the two programs are identical in most ways, we'll have occasion to say that a lot.

We're going to use MCALL to mean "AMCALL and MCALL-II." We'll use AMCALL and MCALL-II only when we need to distinguish one program from the other.

Note that there is a separate program named MCALL; it is a predecessor of MCALL-II. This tutorial does not deal with the program MCALL; the word MCALL, used here, does not refer to it.

When we speak of two computers communicating with each other, we'll refer to the computer running MCALL as "your computer" and the other computer as the "remote computer." Bear in mind that the "remote computer" is not necessarily far away; it may be sitting next to "your computer" on the same table.

This tutorial will teach you to use the basic functions of MCALL. A second installment, appearing in the next edition of *User's Guide*, will teach you to use MCALL's most useful ad-

File Name	Contents
AMCALL.CMD	AMCALL program (16-bit systems).
CONFIG-A.CMD*	AMCALL configuration program (16-bit systems).
AMCALL.COM	AMCALL program (8-bit systems).
CONFIG-A.COM*	AMCALL configuration program (8-bit systems).
AMEXIT*	A data file; tells AMCALL what commands to send to the modem before returning to the operating system.
AMCALL.HLP	The help file.
AMCALL.ZIP	The default configuration file.
PHONE.NUM	A model telephone directory file.

* — not essential; may not be available in your version of AMCALL.

Table 1. *The files you copy from the distribution disk to your system disk to install AMCALL.*

File Name	Contents
MCALL.CMD	MCALL-II program (16-bit systems).
CONFIG-M.CMD*	MCALL-II configuration program (16-bit systems).
MCALL.COM	MCALL-II program (8-bit systems).
CONFIG-M.COM*	MCALL-II configuration program (8-bit systems).
MCALL.HLP	The help file.
MCALL.ZIP	The default configuration file.
PHONE-.NUM	A model telephone directory file.

* — not essential; may not be available in your version of MCALL-II.

Table 2. *The files you copy from the distribution disk to your system disk to install MCALL-II.*

vanced features, such as file transfer.

This tutorial won't teach you to use *all* of MCALL's functions. For more information, see the *AMCALL and MCALL-II Operating Instructions Manual*, packaged with MCALL. Once you are familiar with the basic concepts and functions of MCALL, you'll find the manual easier to understand.

Setting Up

Before you use MCALL, you may have to do the following:

1. Configure your computer and modem to support communications. This may involve steps such as setting switches on the computer and the modem, installing the modem in the computer or cabling it to the computer, and connecting the modem to the telephone system.
2. Configure your computer's operating system to support communications. This may involve running a configuration program or modifying the version of the operating system that is stored on your boot disk.
3. Install MCALL on your computer's operating system disk.

Steps 1 and 2 vary with the computer, modem, and operating system you are using, so we won't discuss them here. If you need assistance with these steps, see your computer dealer or look for a users' group that is oriented toward your brand of computer.

To install MCALL on your computer's system disk, boot the operating system; then put the system disk in one of your computer's disk drives and put the MCALL distribution disk in another drive.

We'll assume the system disk is in drive A and the distribution disk is in drive B. If you use different drive names on your computer, just substitute the appropriate names for "A" and "B."

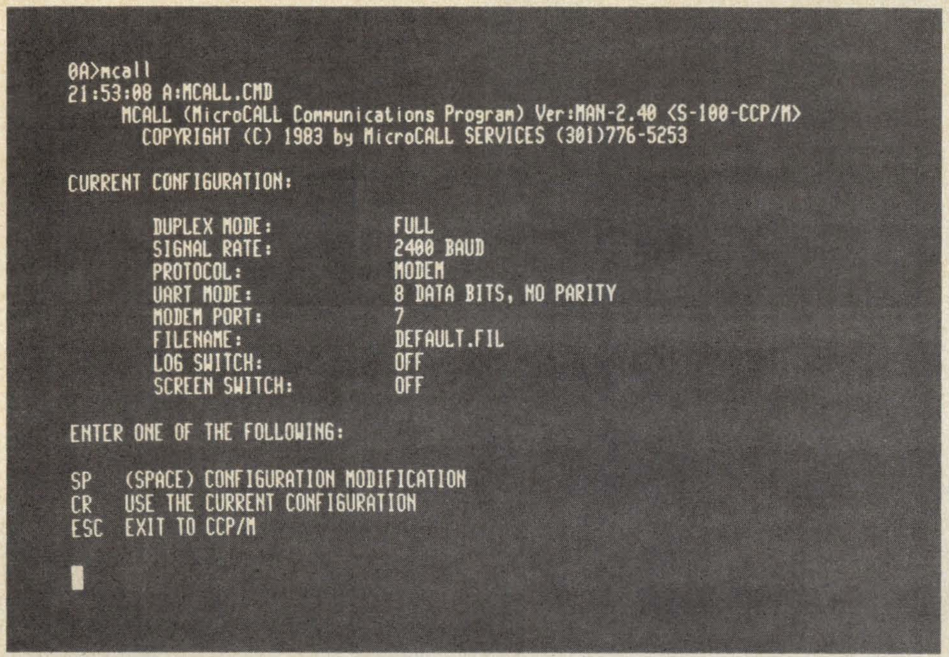
Make a back-up copy of the distribution disk and print a listing of its directory. Look for a file with a name like INSTALL.DOC or README.DOC. If such a file is present, it should be a text file containing descriptions of the files on the disk and the vendor's instructions for installing MCALL.

Table 1 lists the files that you must copy from the distribution disk to the system disk to install AMCALL. Table 2 lists the files you must copy to install MCALL-II. You can copy these files with PIP; for example:

```
A>pip↵
CONCURRENT CP/M-86 PIP VERSION 3.1
*a:=b:amcall.cmd↵
*a:=b:amcall.hlp↵
* (...and so on)
*↵
```

Enter Return (↵) to end PIP after copying the last file.

If you plan to use both AMCALL and MCALL-II, the process will be easier if you install and learn one program, then come back for the other one.



```
0A>mcall
21:53:08 A:MCALL.CMD
     MCALL (MicroCALL Communications Program) Ver:MAN-2.40 <S-100-CCP/M>
       COPYRIGHT (C) 1983 by MicroCALL SERVICES (301)776-5253

CURRENT CONFIGURATION:

        DUPLEX MODE:             FULL
        SIGNAL RATE:             2400 BAUD
        PROTOCOL:                MODEM
        UART MODE:               8 DATA BITS, NO PARITY
        MODEM PORT:              7
        FILENAME:                DEFAULT.FIL
        LOG SWITCH:              OFF
        SCREEN SWITCH:           OFF

ENTER ONE OF THE FOLLOWING:

SP   (SPACE) CONFIGURATION MODIFICATION
CR   USE THE CURRENT CONFIGURATION
ESC  EXIT TO CCP/M

█
```

Figure 1. *MCALL-II's current configuration menu screen.*

The ZIP File

A file with the filetype ".ZIP" controls many aspects of MCALL's operation. MCALL reads the ZIP file when you start it, and behaves as the ZIP file directs. AMCALL normally uses a file named AMCALL.ZIP; MCALL-II uses one named MCALL.ZIP.

If your MCALL distribution disk contains a copy of the program CONFIG-A (for AMCALL) or CONFIG-M (for MCALL-II), you can create a ZIP file to tailor MCALL's configuration to your own needs. For the moment, we're going to stick with the distributed ZIP file. Find out what configuration you want by reconfiguring MCALL interactively each time you run it, and create your own ZIP file at a later date.

Starting MCALL

We'll assume that the remote computer has an auto-answer modem and a time-sharing system of some sort, or (if it is connected to your computer by cable) is running a communication program similar to MCALL.

All information utilities like CompuServe and The Source match this description; so do many remote bulletin board systems (RBBSs). Calling other kinds of computers is a more complex task that will be explained in the second installment of this tutorial.

Before you start MCALL, be sure that your modem is turned on and properly connected to your computer. If your computer and the remote computer are connected by cable, be sure that the remote computer is turned on and the cable is connected at both ends.

To start MCALL, enter the program name at the command line:

`A>amcall`↵ (for AMCALL)

`A>mcall`↵ (for MCALL-II)

The program should display a screen like the one shown in Figure 1.

Under the program's title and copyright notice are two important groups of data.

`Current configuration` shows how MCALL's most important configuration options are set. The options that are important to you now are:

`Duplex mode`: should be `FULL`.

`Signal rate` (also known as baud rate or data speed): should match the rate of your modem and/or the remote computer.

`Protocol`: should be `X-ON/X-OFF` for communicating with most remote systems, including CompuServe and The Source, and microcomputers running most other communication programs.

`UART mode`: should match the remote computer's number of data bits and the parity setting.

`Modem port`: this option is present only in versions of MCALL configured for computers with more than one communication port, such as the CompuPro 816 series. If present, it must be set to the port that is attached to your modem or to the other computer. See your computer's documentation for details.

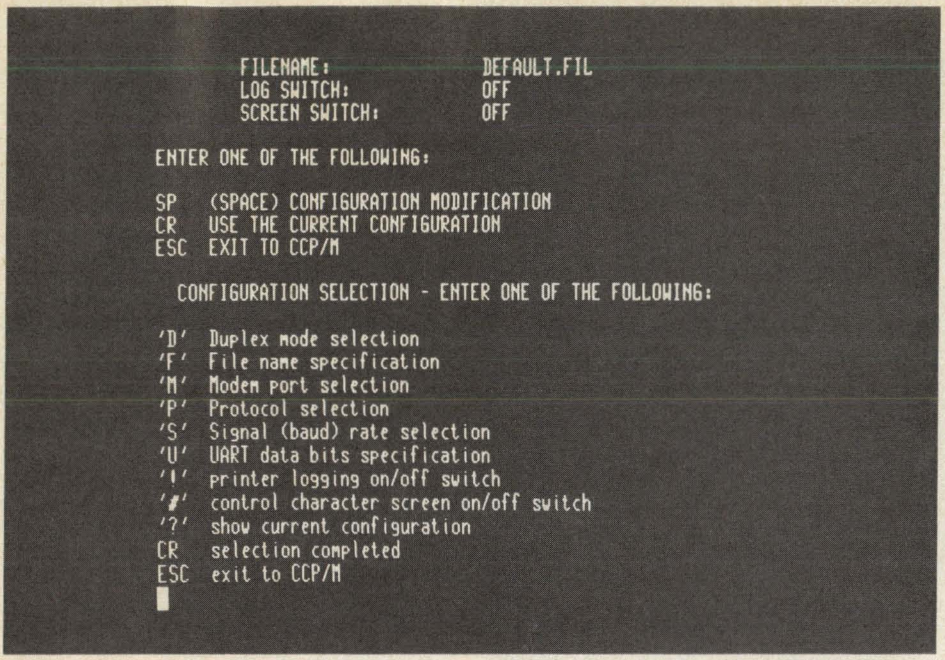
`Enter one of the following` heads a menu of commands you may give to MCALL. You may press:

- The space bar if you want to change any of MCALL's configuration options.
- The RETURN key if you want to accept the current settings of the configuration options and start communicating.
- The ESC or ESCAPE key if you want to terminate MCALL and return to the operating system.

How to Change Configuration Options

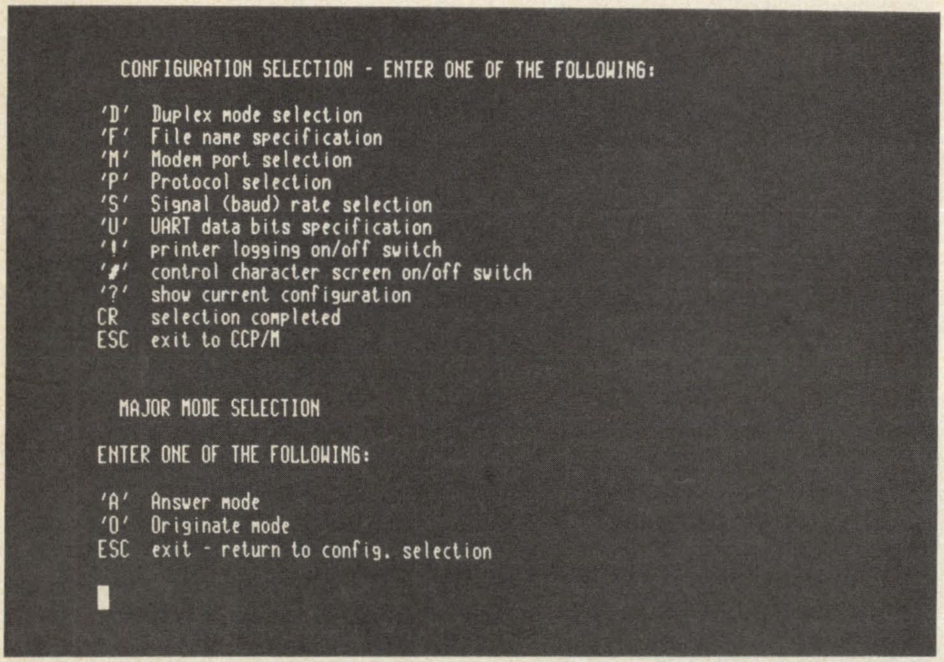
Let's assume you have to change some configuration options before you go to communication mode. (If you don't, or if you're not sure, play along to learn how.)

Press the space bar. MCALL displays a menu like the one shown in Figure 2. This menu prompts you to select a configuration option to be changed.



```
          FILENAME:              DEFAULT.FIL
          LOG SWITCH:            OFF
          SCREEN SWITCH:         OFF

     ENTER ONE OF THE FOLLOWING:

     SP   (SPACE) CONFIGURATION MODIFICATION
     CR   USE THE CURRENT CONFIGURATION
     ESC  EXIT TO CCP/M

       CONFIGURATION SELECTION - ENTER ONE OF THE FOLLOWING:

     'D'  Duplex mode selection
     'F'  File name specification
     'M'  Modem port selection
     'P'  Protocol selection
     'S'  Signal (baud) rate selection
     'U'  UART data bits specification
     '!'  printer logging on/off switch
     '#'  control character screen on/off switch
     '?'  show current configuration
     CR   selection completed
     ESC  exit to CCP/M
     █
```

Figure 2. *Configuration Selection Menu.*



```
       CONFIGURATION SELECTION - ENTER ONE OF THE FOLLOWING:

     'D'  Duplex mode selection
     'F'  File name specification
     'M'  Modem port selection
     'P'  Protocol selection
     'S'  Signal (baud) rate selection
     'U'  UART data bits specification
     '!'  printer logging on/off switch
     '#'  control character screen on/off switch
     '?'  show current configuration
     CR   selection completed
     ESC  exit to CCP/M


       MAJOR MODE SELECTION

     ENTER ONE OF THE FOLLOWING:

     'A'  Answer mode
     'O'  Originate mode
     ESC  exit - return to config. selection

     █
```

Figure 3. *Major Mode Selection menu.*

To select a configuration option, press the corresponding key. For example, to select the `protocol selection` option, press the `P` key.

MCALL displays a menu of possible values for the option you selected and prompts you to select one. Again, press the corresponding key. MCALL sets the value you selected and displays again the menu shown in figure 2.

Try this. If you don't need to change any of the options, select `protocol selection` and then select the protocol that was already set (probably X-ON/X-OFF).

If you press an invalid key, MCALL will display a `?` and then redisplay the menu. (Try it.)

The menu item `CR. . .selection completed` tells you that you can leave the Configuration Selection menu by pressing the Return key when you're done changing configuration options. ("CR," for "carriage return," is a common name for the Return key.)

Next, MCALL displays a menu like the one shown in Figure 3. Select `Originate mode`.

Establishing the Connection: AMCALL

What happens next will depend on which program you are using. This section describes AMCALL; the next describes MCALL-II.

AMCALL displays a screen like the one shown in Figure 4. This screen displays the contents of AMCALL's "telephone directory" and prompts you to choose the phone number you want to call.

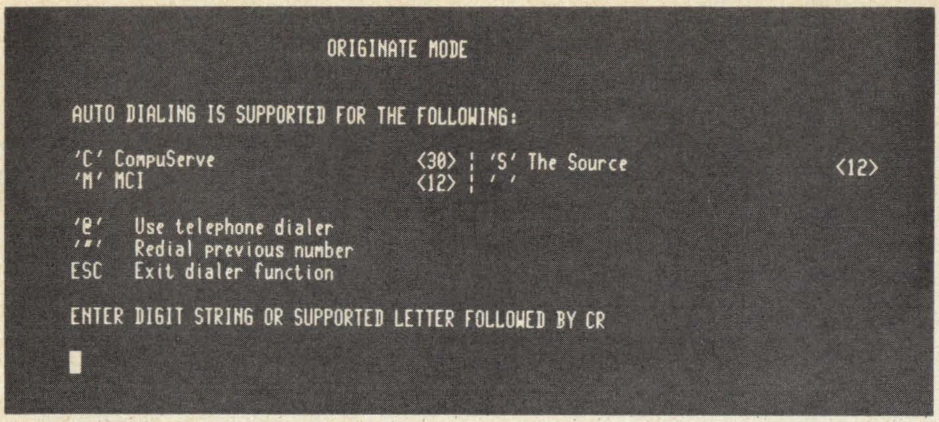
Unless someone has set up the phone directory file for you, it does not yet contain any useful entries. You'll have to dial the remote computer's phone number "by hand." (Remember, if your communication link is a cable rather than a modem, you should be using MCALL-II, not AMCALL!)

Type in the phone number. You may (but need not) include hyphens in the number for legibility. End the number by pressing Return.

`555-1212` ↵ (is OK)
`5551212` ↵ (is also OK)

When you press Return, AMCALL electronically dials the number by sending a command to the modem. Depending on the type of modem you have, you may be able to hear the dialing, the ring, and the remote computer answering the phone.

When the remote computer answers, AMCALL displays the message, `Connection has been established, begin communications.` Now anything you enter on your keyboard will be relayed to the other computer, and anything AMCALL receives from the other computer will be displayed on your screen.



```
                    ORIGINATE MODE

AUTO DIALING IS SUPPORTED FOR THE FOLLOWING:

'C' CompuServe                <30> ¦ 'S' The Source              <12>
'M' MCI                       <12> ¦ ' '

'@'   Use telephone dialer
'*'   Redial previous number
ESC   Exit dialer function

ENTER DIGIT STRING OR SUPPORTED LETTER FOLLOWED BY CR

█
```

Figure 4. *AMCALL dialing menu.*

For a beginner, using MCALL is something like being lost in a strange city: it's not always clear where you are, or how to get from where you are to where you want to be.

Establishing the Connection: MCALL-II Used with a Modem

MCALL-II displays the message, `Enter CR when ready to communicate or ESC to exit`. Press the Return key to enter communication mode.

You must now call the remote computer on the phone. There are three basic types of modems, and three corresponding ways to call:

- If you have an acoustic coupler (a device that couples to a telephone through the telephone's handset), dial the other computer in the conventional way and wait for the computer to answer. When you hear a high-pitched whine (the other computer's carrier signal), press the handset firmly into the acoustic coupler's rubber cups.

- If you have a modem/telephone combination, dial the other computer in the conventional way and wait for it to answer. When you hear the other computer's carrier signal, switch the modem from "stand-by" to "data." (The modem's user's manuals should tell you how to do this.) Then you may hang up the phone.

- If you have a direct-connect modem with auto-dial capability, type the modem's "dial" command into the keyboard, followed by the phone number you want to dial. The modem will dial the call electronically.

The exact procedure for calling the remote computer depends on what kind of modem you have. For details, see the modem's instruction manual, or get assistance from your dealer or a more experienced user.

The remote computer may display instructions as soon as the phone circuit is established, or may wait for you to type something in. See the remote computer's user's guide for details, or consult a person familiar with its service.

Establishing the Connection: MCALL-II Used with a Cable

MCALL-II displays the message, `Enter CR when ready to communicate or ESC to exit`. Press the Return key to enter communication mode.

The two computers should be able to communicate with each other as soon as the remote computer's communication program has been started. Anything typed on one computer's keyboard should appear on the other computer's screen. (Depending on how the remote computer's communication program is set up, anything typed on one computer's keyboard may appear on *both* computers' screens.)

If It Doesn't Work

What if you do everything right, and MCALL doesn't cooperate?

There are many things that can go wrong with communication between computers, and not all of them are easy for a novice to diagnose. The following checklists should get you started, though. If they don't help, seek expert assistance.

The following procedures will help you determine what kind of problem you have:

1. Symptom: MCALL won't start; it displays a message like `Auxiliary (modem) ports have not been set up...` and returns to the operating system.

Problem: Your operating system has not been configured for use with a modem program like MCALL. Ask your dealer for assistance.

2. Symptom: Your auto-dial modem does not respond to the "dial" command (or anything else).

Problem: the cable connecting your computer and modem is not connected or is incorrectly wired; or your modem is not turned on, is not correctly configured, or is not working.

Tip: If your modem does not let you hear the dial tone, dialing pulses, and carrier signal as it dials, attach a conventional telephone to the same line and listen in while you try to make the telephone connection.

Another tip: Your modem probably has an indicator light labelled 'CARRIER', 'CA', or 'CD'. Watch this light while you try to make the telephone connection. The light goes on when (if) the connection is made and the modem detects the other computer's carrier signal. The carrier detect light should go on within a second or so after you hear the carrier signal.

3. Symptom: The remote computer does not answer your phone call, or does not send a carrier signal when it answers.

Problem: the remote computer is not functioning now, or you have dialed a wrong number.

4. Symptom: The data the remote computer sends you appears on your screen as nonsense.

Problem: the serial interface parameters set on your computer do not match those set on the remote computer. The remote computer's operating instructions should tell you how it is set. Adjust one or the other computer so that the serial interface parameters match.

5. Symptom: The remote computer does not respond to your commands after the telephone or cable connection has been established.

Problem: The remote computer is not functioning now, or its serial interface parameter do not match those on your computer.

Leaving MCALL

When you're done using MCALL, here's how to return to the operating system:

1. If the remote computer is running a time sharing service, log off the service. If it is another personal computer, enter whatever "end of session" commands its software expects.

2. If the remote computer is part of a time sharing service, break the telephone connection ("hang up the phone"). If you have an auto-dial modem, the remote computer may break the connection automatically when you log off. If it does not, you should be able to break the connection by entering an appropriate command to your modem. See the modem's user's manual for specifics.

3. Leave MCALL's communication mode. If you're running AMCALL, it may leave communication mode automatically when the telephone connection is broken. If it does not, or if you're running MCALL-II, press the Escape key (labelled "Escape" or "Esc" on most keyboards), then the E key. (We'll abbreviate this sequence ESC-E.)

4. Return to the operating system by pressing the Escape key again.

"Escape" Commands

The ESC-E command mentioned above is one example of an MCALL command that you can enter while MCALL is in communication mode. MCALL recognizes many other such commands, all of which consist of the Escape key followed by some other key. Thus they are called escape commands.

One useful escape command is ESC-H (for "help"), which lists all of MCALL's escape commands. When you need to use an escape command but can't recall its name, ESC-H can remind you.

Since MCALL interprets the Escape key as the start of an escape command, you can't send the remote computer an "escape" character (the "character" whose digital code is generated by the Escape key) except by pressing the Escape key. To send an "escape" character, enter the command ESC-ESC; that is, press the Escape key twice.

Recording an MCALL Session

It's often useful to record an MCALL session in a file in order to preserve a program's output, or to keep a record of how to run a certain program on the remote computer.

To record an MCALL session you must use three escape commands: ESC-F ("file name"), ESC-R ("receive"), and ESC-E ("end").

Any time after you enter communication mode, enter ESC-F. MCALL prompts you for a file name. Enter any unused file name and press Return.

To start recording, enter ESC-R. MCALL creates a file with the name you specified, and starts saving incoming data (including the remote computer's echo of data you enter) in a buffer in RAM. To stop recording, enter ESC-E; MCALL saves the contents of the buffer in the file. That's all there is to it.

If the buffer fills up, MCALL sends the remote computer an XOFF (a character meaning "stop sending"), empties the buffer into the file, and sends an XON (meaning "resume sending"). Thus you can record more data than fits in your computer's RAM — assuming the remote computer respects the meaning of the XON and XOFF characters.

If you try to turn recording on and off several times, though, you'll have a problem. Each time you enter ESC-R, AMCALL creates a *new* file with the file name you specified with ESC-F. The existing file, if any, is saved with the filetype ".BAK"; the existing ".BAK" file, if any, is erased. This makes it awkward record parts of an MCALL session selectively. Each time you turn recording on you must enter a new file name, or you'll lose every recorded segment of the session before the immediately preceding one.

You can solve this problem by using two more escape commands, ESC-W ("write") and ESC-C ("clear"). ESC-W *writes* the contents of the recording buffer to the file, and clears the buffer. ESC-C *clears* the buffer without writing it to the file. Thus, to record data selectively, you can enter ESC-W after receiving data that you *want* to save, and enter ESC-C after receiving data that you *don't* want to save.

For example, suppose you display four notices from a remote computer's bulletin board system. After displaying the first and third messages, you decide that you want to save them; after displaying the second and fourth messages, you decide that you don't want to save those. You could reach the desired result like this:

1. Before displaying the first message, enter ESC-F to specify a name for a recording file, and ESC-R to make MCALL begin recording.

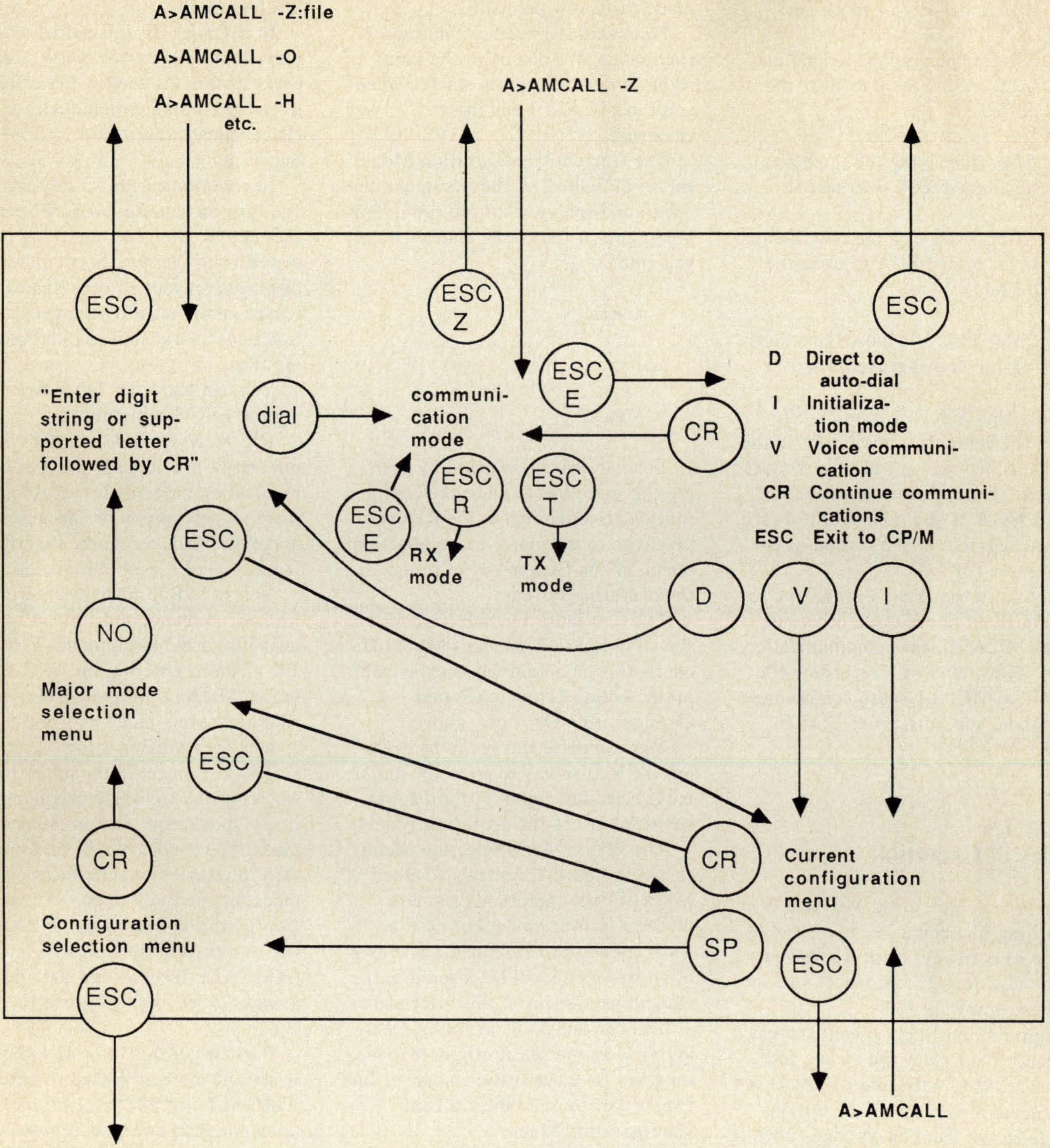

A>AMCALL -Z:file
A>AMCALL -O
A>AMCALL -H
etc.
A>AMCALL -Z
ESC
ESC Z
ESC
ESC E
D Direct to auto-dial
I Initialization mode
V Voice communication
CR Continue communications
ESC Exit to CP/M
"Enter digit string or supported letter followed by CR"
dial
communication mode
CR
ESC E
ESC R
ESC T
RX mode
TX mode
ESC
D
V
I
NO
Major mode selection menu
ESC
CR
CR
Current configuration menu
Configuration selection menu
SP
ESC
ESC
A>AMCALL

Figure 5. *AMCALL state diagram.*

2. After displaying the first message, enter ESC-W to save it.

3. After displaying the second message, enter ESC-C to clear the buffer.

4. After displaying the third message, enter ESC-W to save it.

5. After displaying the fourth message, enter ESC-C to clear the buffer.

6. Enter ESC-E to close the recording file and stop recording.

Note that ESC-E *automatically* writes the contents of the buffer to the file. Thus, if you want to save the last segment of the session, you need not enter ESC-W. If you *don't* want to save the last segment of the session, you *must* enter ESC-C.

Note also that ESC-E closes the recording file if one is open; otherwise it makes MCALL leave communication mode. Thus, to close a recording file *and* make MCALL leave communication mode, you must enter ESC-E *twice*.

MCALL's Modes of Operation

For a beginner, using MCALL is something like being lost in a strange city: it's not always clear where you are, or how to get from where you are to where you want to be.

Figure 5 and figure 6 help you get oriented. They show the modes and menus of AMCALL and MCALL-II and the commands or menu options that take you from one mode or menu to another. Keep these charts handy until you feel ready to run the programs without them.

Each figure represents AMCALL or MCALL-II as a rectangular box. Arrows that enter the box represent ways to start the program, and arrows that leave the box represent ways to end it. Arrows within the box represent ways to move from one mode or menu to another. At the root of each arrow is a circle containing the command you must enter to enter the mode the arrow points to.

Following is a brief explanation of each mode. We'll start in the lower right corner (where you started when you ran MCALL) and move clockwise.

The Current Configuration Menu, shown in figure 1, is the first menu the program displays when you run it with no options or filenames; that is, when you enter:

```
A>mcall↵
```

or:

```
A>amcall↵
```

You can leave this menu by pressing the space bar to go to the configuration selection menu, the Return key to go to the major mode selection menu, or the Escape key to return to the operating system.

The Configuration Selection Menu, shown in figure 2, changes MCALL's configuration options. It is explained in the section "How to Change Configuration Options," above.

You can leave this menu by pressing the Return key to go to the major mode selection menu, or the Escape key to return to the operating system.

The Major Mode Selection Menu, shown in figure 3, controls whether MCALL will operate in originate mode or answer mode. For now, always select originate mode. (The uses of answer mode will be covered in the second installment of this tutorial.)

You can leave this menu by pressing the O key to select originate mode, the A key to select answer mode, or the Escape key to go to the Current Configuration Menu.

The next mode has no name; it is actually just a preface to communication mode.

In AMCALL, this mode displays the phone numbers in the dialing directory and prompts you to select the phone number you want to dial. You may also enter a phone number from the keyboard, as you did in this tutorial. After you select or enter a number, AMCALL dials the number. It proceeds to communication mode when a connection with the remote computer has been made.

In MCALL-II, this mode just displays the prompt `Enter CR when ready to communicate or ESC to exit`. Press Return to go to communication mode, or ESC (Escape key) to return to the operating system.

In *communication mode*, anything you type on your keyboard is sent to the remote computer; anything received from the remote computer is displayed on your screen. You can use escape commands to perform such functions as transmitting and receiving files.

You can leave this mode by entering the ESC-E command.

RX (receive) mode and *TX (transmit) mode* are actually parts of communication mode. It is useful to treat them as separate modes because they make MCALL recognize slightly different sets of escape commands.

You go to RX mode by entering the ESC-R command, and leave it by entering the ESC-E command. You go to TX mode by entering the ESC-T command; MCALL normally returns to communication mode by itself when it is done transmitting a file.

The last menu, in the upper right corner of the rectangle, has no name; it is a "postscript" to communication mode. You can leave it by pressing Return to return to communication mode, or the I key to go to Current Configuration Menu, or the Escape key to return to the operating system. (AMCALL recognizes some additional ways of leaving this mode.)

Part two of this tutorial will describe the more advanced features of AMCALL and MCALL-II, including uploading and downloading with communication protocols and setting configuration details for future use.

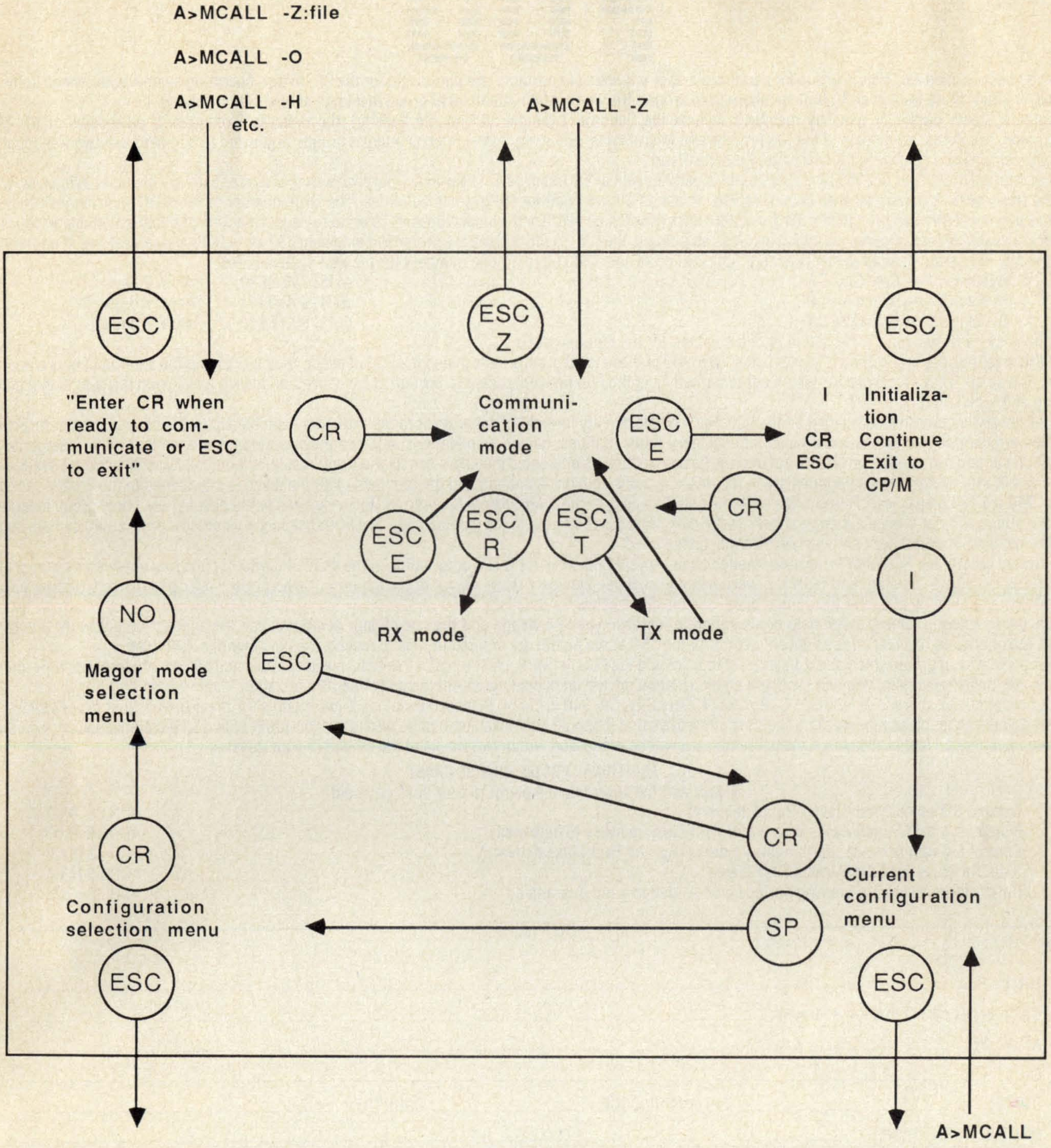

A>MCALL -Z:file
A>MCALL -O
A>MCALL -H
etc.
A>MCALL -Z
ESC
ESC Z
ESC
"Enter CR when ready to communicate or ESC to exit"
CR
Communication mode
ESC E
I
CR
ESC
Initialization
Continue
Exit to CP/M
CR
ESC E
ESC R
ESC T
RX mode
TX mode
I
NO
Magor mode selection menu
ESC
CR
CR
Configuration selection menu
SP
Current configuration menu
ESC
ESC
A>MCALL

Figure 6. *MCALL state diagram.*

FOG

FOG has been formed as a User's Group for persons using or interested in portable computers and/or the CP/M disk operating system with related software. In December of 1984, there were over 15,000 members from around the world. Most attend local group meetings at over 300 locations.

Computer systems owned or used by members include the Osborne 1 (single and double density), the Osborne Executive 1, all models of the Morrow MicroDecision, the Zorba, all models of the KayPro, several MicroMates, and many more. Special interest groups organized to augment a network of local group meetings include dBase II, Ham radio operators, Personal Pearl.

FOG was started in October of 1981 by a small band of early buyers of the Osborne 1. The primary purpose was to organize a library of public domain software to run on the Osborne 1. A newsletter was quickly started to act as a focal point for the group's activities. The large number of excellent contributions to both the library and the newsletter has produced a library of 260 disks (as of May, 1985) and a nicely typeset (70 or more pages) monthly publication. All back issues of the ***FOGHORN*** are available for a nominal fee which includes shipping in the U.S. Contributions are currently being solicited for bulletin board systems in addition to the thirty currently in operation. Most systems accept both 300 baud and 1200 baud. Phone numbers for the first systems are:

System #1 — Daly City, CA	(415) 755-2030	24hrs/7 days
System #2 — Vancouver, BC	(604) 596-0314	24hrs/7 days
System #3 — Daly City, CA	(415) 992-8542	24hrs/7 days

Each of these systems will have a file listing phone numbers for the other systems.

While the meetings are organized on a local basis, over 130 of these local groups have joined the FOG network, thus increasing the sharing of information, tips, problems and so on. Those local groups which opt to formally join the FOG network receive a portion of local member dues to assist with the cost of maintaining a local copy of the disk library.

The FOG library is currently maintained on the Osborne 1 single density format but separate libraries are being established for the other computer formats. The library files are carefully screened and divided into category types (utilities, games, applications, and computer languages are the four major categories). Programs which contain run or other errors are put into the hacker section so interested members can fix them and resubmit for inclusion in the correct section. Items which do not fit into one of these categories are in the miscellaneous section. A catalog and descriptions of all the discs is maintained in the library section.

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Circle 11 — Reader Service Card

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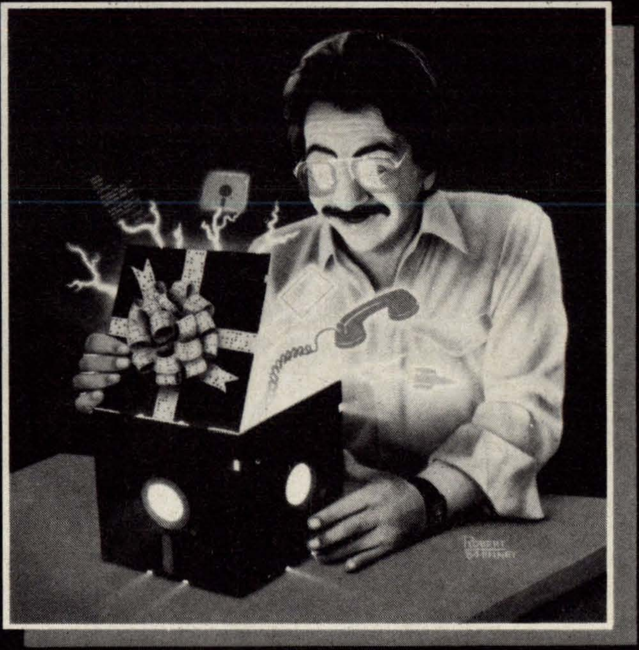

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TONY BOVE, CHERYL RHODES, AND KELLY SMITH

Circle 3 — Reader Service Card

The Bizcomp Intellimodem Ext

A lot of bang for a lot of buck, from the inventors of intelligent modems.

by Byron A. McKay

In 1978, Michael Eaton began work on, and soon completed the first intelligent modem — while he was completing a PH.D. at Stanford University. Frustrated at having to redial the extremely busy Stanford mainframe computer's telephone access number, he foresaw a need for convenience of modem setup with quick and easy dialing and answering. This was fortunate for those of us who so often use our modems to perform our various work-a-day routines, as his work has changed the face of how modems are used.

Using an 8-bit microprocessor, the Model 1030 (as it was eventually to be known) was able to dial, hang up and answer with a few ASCII characters being sent to it to inform it of what to do. This was a radically different approach to using modems, and offered new vistas for *intelligent* modems to come.

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Bizcomp Intellimodem EXT is by Bizcomp, 532 Mercury Drive, Sunnyvale, CA. 94086-4018. Phone: (408) 733-7800.

Price: **$499.00** includes manual.

All was not roses though, as Eaton's brain-child — like so many others in this industry — became obsolete by a licensed competitor, Hayes Microcomputer Products Inc. (then D.C. Hayes) of Norcross, Georgia.

It seems Hayes had obtained the right to use Eaton's patent, but had developed a new command set based on Eaton's (that's right, the world-famous "Hayes-compatible" was not an original!), which Hayes maintained was superior to the original Model 1030 command set.

Arguments flared and Eaton stuck to his guns, proving his convictions, but losing his huge jump on the modem marketplace while the Hayes Smartmodem line of products made a killing.

For the next three years (1979-1981), slow, painstaking research and development on newer models, and the relentless tenacity on Eaton's part of staying with the original Bizcomp protocol, would make Hayes and others leading sellers, while most first-time modem buyers would have little or no inkling of the names Bizcomp, or Michael Eaton.

To this day, Hayes and all other manufacturers who share the same methodology of commanding their wire wizards pay royalties to make use of the patent which Eaton owns. Like the ancient philosopher said when surrounded by the enemy, if you can't beat em' join em'! And join them Bizcomp did, developing a new line of highly intelligent modems which were Hayes-compatible.

So, it is with some interest that I received a Bizcomp Intellimodem EXT, the newest and finally Hayes-compatible modem. Would the company that started all the smart-modem technology be able to make as good or better a modem as any or all of the others? The answer was quick in coming, and not too surprising.

Packaging and Documentation

I took my motorcycle to the offices of Bizcomp in Sunnyvale, California (not far from "the cave" here in Mountain View), to pick up the modem. Using that motorcycle has proven to be one of my most valuable reviewing tools, as nothing exposes loose connectors, shoddy construction, or sloppy assembly faster than being bounced around city streets for a few miles on the back of the "Red Racer".

On arrival home with the modem in tow, I spent some time going down through the layers of packaging to get to the modem itself. First came techno-standard heat-shrink wrap — the true foundation of the computer industry, I sometimes think. Then came an outer slip cover which is not only attractive, but informative as well, and finally to a heavy gauge cardboard box with custom poly-foam lining wherein lay the treasure! Packaging seemed to be well thought out, and a secure ship if there ever was one. Shipping is important in a modem, not only from the factory to you or your dealer, but also when you have to return it for repair. Since all modems have to be repaired (legally) by the factory, the packaging is important, and should be saved for future use.

Opening the box, I found immediately on top:

1. a strange little packet of un-used velcro tape (which later turned out to be used to adhere the Intellimodem to the side or top of your computer),
2. what is obviously the modem,
3. what is obviously the power supply (wall plug transistor radio-type)

— but no documentation in sight. Not a real problem for most of us, but it would be nice to see a packing memo with some helpful hints on how to get going, what to plug into where, etc.

After lifting the contents out, you are greeted with a very well-printed manual with clear phototypeset printing throughout (take note U.S. Robotics!) and several illustrations. Inside this lovely work are found the usual user-registration card, a NewsNet information service subscription form and brochure, a serrated edged, pullout quick reference card (very complete), and 100+ pages of informative and well written manual.

The manual itself is on a par with (if not a little better than) the Hayes manuals, which were the best I had seen to date. The Bizcomp manual offers easy reading, with the all-important installation and RS-232 data right up front where it should be. An excellent table of contents and a several-page index were also present — making finding information quick and easy. The manual also uses the keyed "colored" (black) edges to allow you to find chapters and sections faster (a feature I *love*).

On the negative side however, illustrations regarding the software packages which Bizcomp uses have lead several people who read the manual to believe the modem is strictly for use on an IBM PC, and no other computer.

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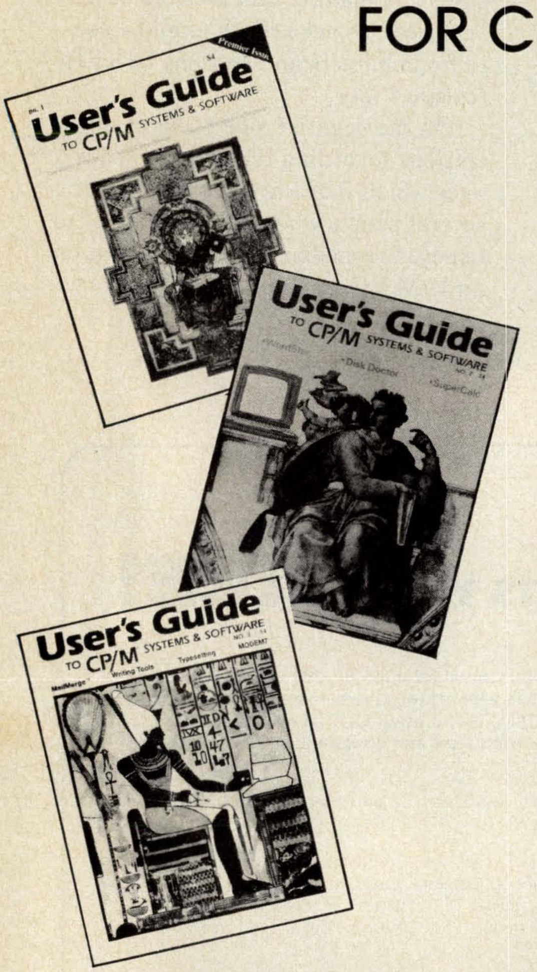
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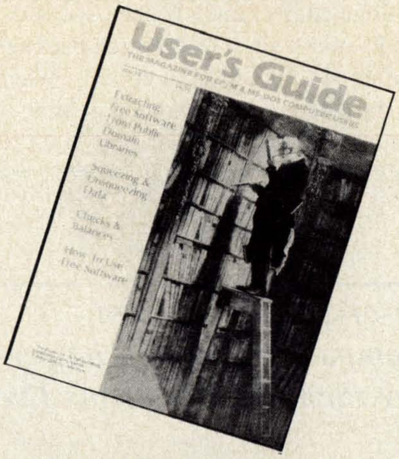

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No information is given on using any other software package with the modem, nor is any information provided for cable requirements for other machines. This impression did not detract from the manual overall. If I had the choice of any modem manual to program from, the Intellimodem EXT manual certainly would be one of my selections.

Bizcomp has put together a state-of-the-art modem, packed with features, in a very compact package. The performance was as good as or better than other modems I've tested recently.

Physical Characteristics

Physical inspection reveals the modem is smaller than any other 300/1200 baud modem I had ever seen. It is approximately two thirds the size of my Hayes (yes, I have one of those, too), about three quarters the size of my US Robotics Password, and almost half the size of the new Signalman Express. You portable computer (Osborne, Kaypro, etc.) owners should take note —this is a *small* modem.

The case is slightly gray-white, and matched the case of my Osborne Vixen quite well and measures 7.5 x 4.5 x 1.5 inches! The case is attractively molded, and the aesthetics are quite pleasing to the eye. A row of multicolored LEDs is placed on the front face panel (facing the operator). A side mounted switch — if it can't be in front, side is second best! — is located on the right hand side (from the operator) and offers convenient power up and power down.

Along the rear face you will find a standard female RS-232C type DB-25 25 pin connector, a power connector for the external wall-plug power supply, and both a phone and line jack enabling you to plug in your phone to the modem, and use it as always (more on this later). The top of the case is well ventilated, and the speaker openings allow the speaker to be clear and precise in operation.

Flipping the modem over reveals four rubber feet, two Velcro male patches (remember that little bag?), a volume control knob for the speaker and a nine switch DIP switch package. Adhered to the bottom cover — where it should be, on the outside — is a quick reference chart of how to set the DIP switches (hot dang — I hope this trend is catching on!), and the modem's serial number.

Connectors for phone line and phone plugs are of the RJ-11 type, eliminating the need for those cutesy little "Y" adapters that everyone else seems to make you buy (Anchor Signalman has RJ-11 type connectors as well). Quality throughout on all the connectors is outstanding.

Setting Up and Installation

The critical test was at hand — had the modem survived the crushing abuse of "The Red Racer"? Could it take the ground shaking impact of Yamaha's finest? Yes! Plug-in and installation proved remarkably simple, and no damage due to faulty manufacture or "The Red Racer" had occurred. It came up the first time and has continued to work since.

Installation consisted of plugging in a straight-through cable (Intellimodem uses DCE so most new computers are straight-through cables — older computers may require some pin switching), setting the DIP switches on the bottom of the modem (covered in the manual very well, but I used the little chart gadget on the bottom — which ended up being the factory setting!), plugging in the power plug, and off I went!

Installation is similar to most new Hayes-compatible modems, as the pin configurations on the RS-232C connectors are all starting to match what Hayes did (which is correct to standard by the way). Pin configuration is covered very well in the manual, with both descriptions and illustrations.

My software packages (MDM740, MEX112, MOVE-IT, MITE and IMP) were set up for a Hayes Smartmodem, so I decided to give them all a whirl. I was truly shocked when *all* of them worked first time, with no modifications.

Compatibility with the Hayes seems to be complete for calling out, but the true test would be to use it for a day or two on my BBS system (Mountain View RCP/M (415) 965-4090) which is currently using the BYE500 series of programs and the Metal Message System. I changed the DIP switches to match similar settings being used on my Hayes, and voilã — this also worked like a champ.

Performance

The Bizcomp Intellimodem EXT is a Bell 103/212a-series compatible modem. In low-speed mode, it is capable of both 110 and 300 baud; asynchronous; 7 or 8 data bits; 1 or 2 stop bits; odd, even, mark, space, or no parity operation. In high-speed mode, the modem uses 1200 baud (also known as bits per second); asynchronous; 7 or 8 data bits; 1 stop bit; odd, even, mark, space, or no parity operation.

Dialing is accomplished in either rotary pulse, or DTMF dial tones, and seemed to work well on both my home phone with DTMF, and at friends' offices where only the best rotary dialers will work at all. Commands for dialing are straightforward and identical to the already much used Hayes-compatible modems.

The modem seemed to perform cleanly on both short and long haul lines, taking only one hit in the entire time I used it. Compatibility was very good with host computer systems and once on line, Intellimodem stayed on line.

The front panel display of LEDs assures that the operator knows at all times exactly what is going on with the modem. LED displays are provided for the following:

1. High speed or low speed operation selected.
2. Auto answer selected.
3. Carrier detected.
4. Modem off hook.
5. Modem receiving data.
6. Modem sending data.
7. Modem Terminal Ready (DTR high indicator).
8. Modem ready (self tests have checked out).
9. Incremental line quality display.

The line quality display is read rather like newer LED VU-type meters, with from one to six LEDs lighting up — the more LEDs lit, the better the line quality. The two left-most segments of the display are red, the two middle segments are yellow, and the two right-most segments are green. The better the connection, the further to the right the segments are illuminated. As long as the green and yellow segments are lit most of the time, your telephone connection is probably satisfactory for most applications. I have not seen this feature on *any* other modem to date.

Features

The Intellimodem EXT has many features which set it apart from the ordinary modems found in today's market place. Some of those features are:

1. An audio leveler — fast attack, 30 db dynamic range. This device will "level" audio when the change from voice to data is made, and is very important when using the modem with spurts of voice conversation in between. More on voice toggling in a moment.

2. Line quality display. This bar graph-type display has been previously mentioned, but a brief word of explanation seems in order. The quality of today's phone lines could be described as abysmal at best. This feature alone could save you a fortune in long distance bills by alerting you when the phone line you are about to use for file transfer activities is not-so-good. Every modem should have some form of this device. Bizcomp is so far the first and only company to offer it.

3. Voice Toggling. If you and the other caller you are going to talk to with your modem need to have voice conversations as well as data exchanges, and you are both using Bizcomp EXT modems, you merely pick up the phone and start talking. This feature is very nice for one line homes and small offices. Both ends must be using Bizcomp modems to do this. Normal modems will either drop carrier, howl in your ear, or do other unpredictable things.

4. Call progress detection. The Intellimodem EXT has the ability to alert you that:
   1. Line is busy
   2. Dial tone detected
   3. Remote is ringing
   4. Carrier detected
   5. Dead line detected
   6. Voice answer detected

   — all of which may be programmed in or out in your software to alert you to the status of your dialing.

5. Receive Sensitivity. Bizcomp claims a receive sensitivity of -50 dbm, which is almost twice as good as any modem I have seen to date. This receive sensitivity assures high quality reception of the output from your host computer, and aids greatly in cutting the cost of file transfers.

Overall Impressions

Bizcomp has put together a state-of-the-art modem, packed with features, in a very compact package. The modem's performance was as good as or better than several other modems I have tested in recent history. Servicing is on a par with other companies, as all servicing occurs at the factory (the FCC's fault, not Bizcomp's), and the company seems to take great pride in both workmanship and service.

Bizcomp has a tradition of waiting until a thing is good before releasing it. This modem seems to be no exception to that rule. The Intellimodem EXT offers incredible receive sensitivity, and that line monitor, which could save you a lot of money if you do a lot of file transfers over long haul lines.

As a modem for first time users, the Intellimodem is friendly and easy to use. A first time business customer will love the money it will save on long-haul calls. Old pro's with BBS and such-like activities will love the line monitor and the Hayes compatibility for programming.

Those who would use the modem over short hauls, or infrequently, may not find the features mentioned to be advantageous enough to justify the price tag of the modem. Without them, it would be just another "Hayes-compatible".

The major failing I could find was price. The Bizcomp's suggested list of $499.00 although lower than some, is still well beyond the home and hobbyist market place. Businesses who have lots of bucks will have no problem with it, but "Joe Six Pack" might not find the features competitive with other modems retailing at half the suggested list price. Since the modem uses a custom chip set, and is of high quality, I see little chance of the price being lowered in the near future.

Overall, if I was looking for a good, well made modem, I could do a lot worse than the Bizcomp. I fell in love with some of its features, and the size made me a friend of it for life. If asked whether I would purchase one myself, the answer is a definite "Yes", so now all I have to do is see if I can talk them out of this test unit I have! It's good to see a high quality product from a founding-fathers-type of company. I am impressed!

Visionary 1200 Intelligent Modem

It can automatically dial stored phone numbers, receive and store messages, and send/pick up your electronic mail, and emulate telex, without involving you or your computer.

by Tony Bove & Cheryl Rhodes

Visionary Electronics packs a lot of functions into its Visionary 1200®, a 1200-baud auto-answer auto-dial programmable modem. The modem can function independently (that is, by a program you write using the modem's command set), or interactively in response to your typed commands. It can be programmed to pick up your electronic mail while you and your computer do something else. You can set up the modem to send and receive messages and dial into information services and electronic mail systems at certain times of the day and on certain days, without your involvement (except to initially program it). The Visionary 1200 also has an "answerback" capability that lets it emulate telex.

The prototype modem we received last year was nearly twice the size of the Hayes Smartmodem® and packed with electronics. The released version is repackaged to be smaller than the Hayes so that it takes up less space on your desk; however, it has not significantly changed in features or performance. One feature was added: Hayes Smartmodem compatibility in the auto-dial function (the Hayes is recognized as a standard among personal computer modems, and many others conform to the Hayes standard in auto-dialing). However, the Visionary modem has so many smart functions it makes the Smartmodem look dumb.

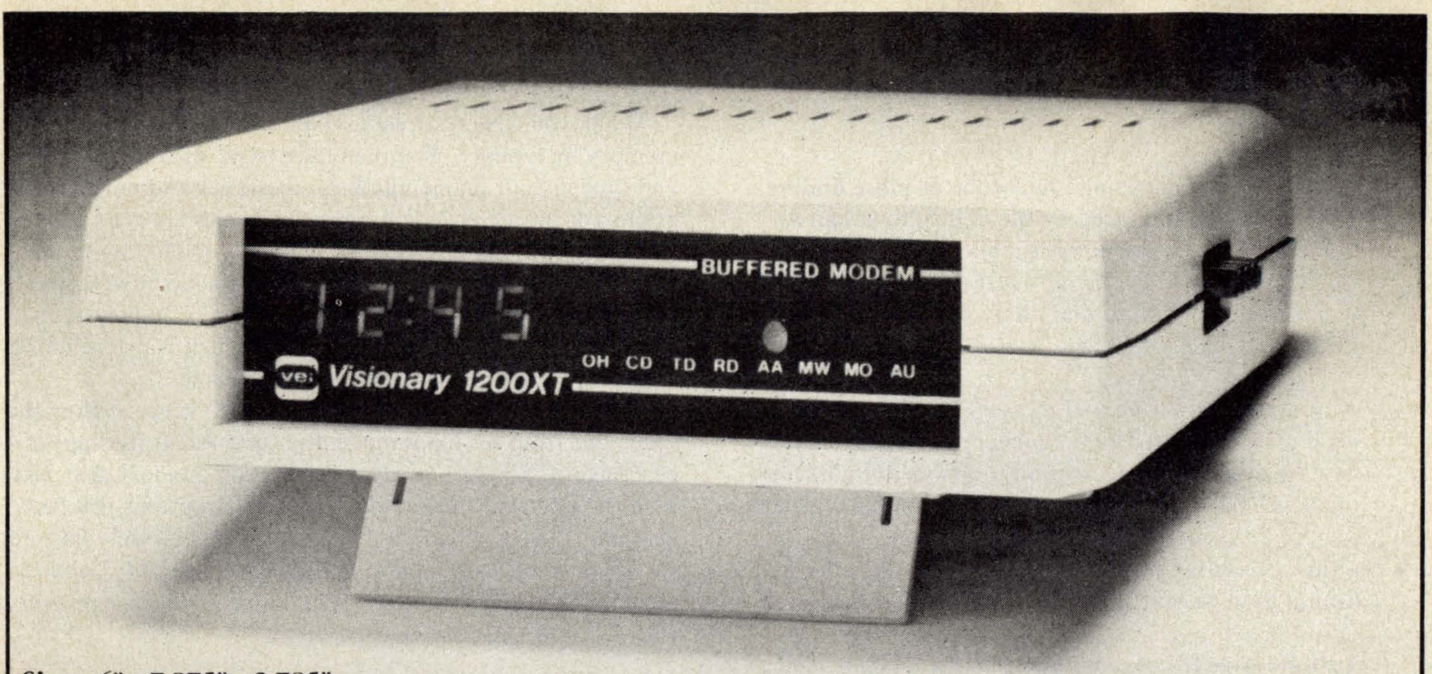
A Hayes Smartmodem and most compatible modems can dial and re-dial a number, and can be set up to answer calls, but they can act only as conduits of information, not as message carriers. The Visionary can act as a message carrier — you can store messages in its memory, and it can dial a number and transmit the message automatically at a certain time and on a certain day, without the need for you to type commands at that time and day. It can also receive messages and store them in its memory without involving you or even your computer. It can therefore conduct the business of sending and receiving your electronic mail messages without bothering you or taking up computer time. Of course you can at any time access the modem's memory to retrieve the messages.

The Visionary modem displays the time on its front panel next to seven indicator lights. Five of them are standard on modems: they tell you whether the phone line is on or off hook, whether you're sending or receiving, set for automatic answering, and detecting a carrier signal. Another indicator tells you if the modem's memory is full (this memory can hold incoming and outgoing messages, phone numbers, and modem programs), and the last tells you if you have any incoming messages stored in memory.

There is no off switch on the Visionary modem, because it is meant to be left on, even if you turn your computer off. However, if you unplug it or if the power fails, the modem retains memory when the power is turned off. If it didn't retain memory upon power loss, you'd have to re-type all your programs and phone numbers whenever you turned it back

The **Visionary 1200 modem** is from Visionary Electronics, 141 Parker Ave., San Francisco, CA 94118 (415-751-8811).

Price: **$495.00** (plus tax) for a unit with 8K of memory. Additional memory is $20.00 for each 8K module (up to 48K). Price includes a manual.



Size: 6" x 7.875" x 2.785"

The Visionary modem takes the load of communicating off your computer. With the modem, you don't need a sophisticated communications program.

on. This would make the modem more of a nuisance than a convenience, since your computer's communication program can store phone numbers on your computer's disk.

The Visionary modem conveniently retains memory. In our testing we found that the Visionary retained all programs, phone numbers and messages; however the time did not advance while the power was off. This was not a problem because it is easy to reset the time with the SET command.

The modem also automatically sets itself to auto-answer mode when you re-start it after a power failure (or after plugging it in). Most personal computer users will not want the modem to always answer the phone, but anyone with a sophisticated auto-answer application will want this feature, because if the power failed and was restored, you'd want the modem to "carry on" without your help.

For example, you might use the Visionary modem on your office computer to automatically answer the phone, so that you could call the office computer from your home computer. If the power was turned off at the office, then turned back on, you'd want your office modem to be put back in auto-answer mode. The Visionary people anticipated this.

Therefore, before going any further, realize that the Visionary modem is designed for people who want sophisticated communications over a phone line dedicated to computer communications. If your needs are much simpler, you may want a less expensive modem with less features.

Requirements

You can connect the Visionary 1200 to a dumb or smart terminal or to a personal computer that can, with appropriate software, act minimally like a dumb terminal. If you connect it to a computer, you can benefit by programming the modem to communicate at certain times of the day while you go on computing. You can also send files from your computer to the modem's memory. If you use a terminal, you can at least type messages and save them in files in the modem's memory, and you can program the modem.

Your computer or terminal must have an RS-232 connector. The Visionary 1200 modem comes with its own cable to connect to your RS-232 connector. Nearly every personal computer has such a connector, as do most terminals; converters are available from electronic supply houses.

If you're using a personal computer, the *serial port* corresponding to your RS-232 connector should be set to operate at 1200 or 300 baud, with seven or eight data bits, one or two stop bits, no parity, full or half duplex. Usually your communications program lets you set the baud rate and other parameters. If you're using a terminal it must be set to operate at 1200 or 300 baud with the same settings.

Walk Through

Here's a summary of the Visionary 1200 modem's features:

- Automatic dialing using touch-tone or pulse dialing. This feature is enhanced by the ability to assign a name to one or more phone numbers (for example, "STAFF" could be a list of numbers), and the ability to set up a program to dial many numbers and send a message to each number.

- Automatic answering and message receiving, with each message stored in the modem's memory under a new filename. An indicator on the modem lights up if messages have been received, so that you know when to access the modem and retrieve messages — just like a tape-recording phone-answering machine, only with digital data rather than sound.

- Text message files can be stored in the modem's memory, to be sent while you and your computer do something else. Likewise messages can be received while you and your computer do something else.

- Real time clock and calendar, with a crude programming language to use for setting up communications to occur at any time and date. For example you can tell the modem to answer the phone and receive messages between 1AM and 5AM every day, while you sleep.

- Message text can be stored as an incoming message in the modem, or passed to your computer without storing it; either way it can also be simultaneously copied to your printer.

- The modem can perform its own error checking: as each character is sent to the receiving computer, the modem waits until this character is "echoed back", and checks to see if the character echoed is the same as the one sent, before sending the next character. This is not the same as the Modem7/Xmodem error-checking protocol, which is used to transfer more than just text files (and can be in use with this modem if your communications program supports it).

Starting Up

With your personal computer's communication program in terminal mode (or when using a terminal), when you press the space bar, the Visionary 1200 modem detects the baud rate (it knows only 300 and 1200) and presents this message:

```
(C) 1984 VEI Vnn
CLEAR MEMORY (Y/N)?:
```

When you first start using the modem, you clear the memory by typing `Y`. You then have to set the time and date, and type in your phone numbers, messages and modem programs (or have your communications program send them).

After using the modem and typing in or sending phone numbers, messages and modem programs, you can stop using it, return to your computing activities, and even unplug the modem. The memory remains as it was (including time and date, but the time does not advance).

When you turn it on again and activate it by pressing the space bar from terminal mode, the `CLEAR MEMORY` message appears again. You can then type `N` to retain memory as it was, with the phone numbers, messages and programs you had saved, or to clear memory. Either way you probably have to set the time again, but this is easy to do. Type `SET↵` and the modem displays the old time and date for you to type over with the new time and date:

```
-SET↵
JAN 01 84 12:00:00 AM
```

In this example, the dash (-) is the modem's command line prompt.

Before going further into sending messages, you must turn auto-answer mode off, otherwise the modem will try to answer the phone and not be able to make calls out. The modem always starts out with auto-answer mode *on*, so you must turn it off with this command:

```
-AUTO-ANS OFF↵
```

The manual does not tell you to do this, but it should, because you can unwittingly turn on the modem and connect it to a phone line without knowing that it will answer the phone. The modem is designed so that when power outages or brown-outs occur, the modem is able to answer the phone when power returns. This is great unless you are using the modem for dialing out only. If you are a dialer mostly, remember the above command.

Dialing Out

You can use the modem as a normal direct-connect modem by dialing out with Hayes Smartmodem-compatible commands. For example, you can type:

```
-ATDT415-367-1029↵
```

The modem dials this number (this magazine's bulletin board system) and acts just like a direct-connect modem. You can use touch tone dialing, fast pulse dialing, or slow pulse dialing by changing settings described later in this article.

To hang up the phone, type Control-`C` twice to return to the modem's dash command line. They type a Control-`D` to disconnect the modem from the phone line.

You can store numbers in the modem's memory, using a name for one or more numbers, and use the name with the DIAL command. For example, type this:

```
-UGBBS: 415-367-1029. ↩
```

You have just defined a phone number called UGBBS (you end a phone number definition with a period and a Return, shown as ↩). You can use it like this:

```
-ATD UGBBS↩
```

You can also abbreviate this command line into a "custom command" (like a macro) with its own name by defining it like this:

```
-UB: ATD UGBBS. ↩
```

As before, you end the definition by typing a period, then a Return (↩).

Why create *custom commands*? They come in handy if you want to do automatic functions, especially while you sleep or while you and your computer do something else.

Custom Commands

You can set up a custom command to automatically change any settings you need for the system you are calling, and automatically log-on to the system with your name and password or whatever control sequence it expects.

For example, if you need to change the modem to operate with "no parity", without "auto line-feed", at 1200 baud, and in "full duplex" to match the system you are calling (such as MCI Mail), you might define a custom command like this one to automatically place the call when you type it:

```
-CALLMCI: SET PA=N LF=0 BR=2 DU=F ATD MCI. ↩
```

This would work if you had already defined a phone number for the name MCI (you could substitute the number for the name `MCI` in the custom command definition).

To define a phone number, custom command, or message, you type a word followed by a colon (`CALLMCI:`), which becomes its name in the modem's memory. Then you type a *delimiter* symbol such as a quote mark ('). If your message contains a quote mark, you must use something else as a delimiter (we recommend you use the vertical bar symbol ¦ which is almost never used in text messages).

CALLMCI is a custom command in the modem's memory, which can run in the modem without involving you or your computer.

Automatic Log-on

So far you have a custom command that calls MCI, but it doesn't log-in to the service for you. You can use the AWAIT and SEND commands to control log-in.

AWAIT puts the modem in a wait state until a certain string of characters arrive from the system you are calling. This is necessary because systems like MCI Mail take time to process your name, and if the modem sent your name and password at once, MCI Mail would not receive the password. AWAIT slows things down to the speed of the system you are calling.

For example, you can provide a name and password to MCI Mail by using AWAIT to wait for the ending colon of the first message that asks for your name, then SEND to send your name, then AWAIT to wait for the ending colon of the next message asking for your password, then SEND to send your password:

```
-AUTOMCI: SET PA=N LF=0 BR=2 DU=F ATD MCI ↩
LOOP AWAIT '':'' SEND ''ABELL^M'' ↩            (fake name)
AWAIT '':'' SEND ''MCIPSWXZ^M''. ↩         (fake password)
```

The LOOP command sends a series of Returns to the system you are calling to synchronize the baud rate (some systems require it). LOOP sends Returns until it receives one echoed back — proof that full duplex is working.

Automatic Electronic Mail

To continue the above example: suppose you wanted a command that would call MCI Mail, log-on, check your mail, capture it in the modem's memory, log-off and hang up. This command could run while you used your computer for something else, or even with your computer off. The following example comes directly from the Visionary modem's manual:

```
-MCIR: AT 6:30 AM EVERY 1 DAY SET DU=F SET LF=0 ↩
DIAL 543-1560 LOOP              (Your MCI number here.)
AWAIT '':'' SEND ''JDOE^M'' ↩
AWAIT '':'' SEND ''MCIPSW^M''        (Your password here.)
AWAIT ''INBOX has'' AWAIT ''):'' SEND ''PRINT^M'' ↩
AWAIT ''):'' SEND ''INBOX^M'' ↩
CAPTURE MAIL SEND ''^M'' ↩
AWAIT ''):'' SEND ''EXIT^M'' ↩
AWAIT '':''. ↩
```

When you type `MCIR`↩ (assuming you put your correct MCI Mail name, password and phone number in place of the ones in this example), the modem waits until 6 AM every day (it can carry out other activities during this time), then at 6 AM it dials MCI Mail and logs on to the system as before.

Then it waits for the phrase `INBOX has` (part of the MCI Mail message telling you that you have a message), and if it sees the phrase, it continues to look for a `):` (marking the end of the message) before sending the word `PRINT` followed by a Return (`^M`). The custom command continues with dialogue and uses the CAPTURE command to capture any mail in a file called MAIL in the modem's memory. If there is any mail stored in the modem, its MSG WAIT light flashes.

Using the modem one-way is fine for most people, but some users may want to link several Visionary modems in a network for private electronic mail. You can write custom commands for dialing several numbers and leaving messages automatically, and also be set up to receive messages at any time.

For example, you can type a message and store it in the modem's memory:

```
-MEMO1: 'A short message example; ↵
it can be many lines long.' ↵
```

It's easy to type a command to send this message to another Visionary modem:

```
-DIAL 123-4567 SEND MEMO1↵
```

You can use one name to stand for many phone numbers, which makes it easy to distribute one message to several receiving computers in one operation. Here's an example of phone numbers assigned to one name:

```
-STAFF: 123-4567 890-1234W,T111555 666-5432. ↵
```

There are three numbers in this example:

`123-4567`
  A regular number.
`890-1234W,T111555`
  A number, then `W` to wait for a second dial tone, then a comma to pause two seconds, then `T` to switch to touch-tone dialing, and an access number 111555.
`666-5432. ↵`
  The last number followed by a period to end the list, and a Return (↵).

You can now write and run a program like the following one that sends the message to the list of phone numbers:

```
-MEMO: DIAL STAFF SEND MEMO1. ↵
-MEMO↵                    ← this runs the program MEMO.
```

If you wanted the MEMO program to work every day at a certain time, say 9 AM, you could type this program:

```
-MEMO: AT 9:00 AM DIAL STAFF SEND MSG1. ↵
```

However, the other computers may be busy or not answering. You can anticipate these situations:

```
-MEMO: AT 9:00 AM DIAL STAFF SEND MSG1↵
EVERY 5 MIN IF BUSY EVERY 2 HRS IF NOANS↵
```

The words `EVERY`, `MIN` (minutes), `IF BUSY`, `HRS` (hours) and `IF NOANS` (no answer) are reserved words understood by the modem when used in modem programs. You can also use `DAY` and `MON` (month).

Displaying Memory and Status of Calls

To see what you have in memory, use the LIST command:

```
-#LIST↵
  PROGRAMS: MEMO
   NUMBERS: STAFF, BILL
TEXT FILES: MEMO1
  MESSAGES:
```

You can erase any file with the ERASE command, or display it with the PRINT command (for example, `PRINT MEMO1↵` and `ERASE MEMO1↵`).

You can display the programs waiting to run, and the status of other operations, with the STAT command. You might type STAT and see something like the following:

```
-STAT↵
PA=E      HD=F      DU=F      EC=0      DI=T      LF=1

COMO1: 123-4567                    BUSY
       890-1234W,T111555 666-5432 FILE SENT
```

The `COMO1:` label identifies a program that is waiting for time to pass before doing its function. You can abort the operation of such a program by typing the ERASE command with this label:

```
-ERASE COMO1↵
```

Note that you did not erase MEMO, the actual program, which can be left in the modem's memory to be used again.

The modem comes with a programming language to set up communications to occur at any time and date. For example you can tell the modem to answer the phone and receive messages between 1AM and 5AM every day, while you sleep.

Receiving Messages

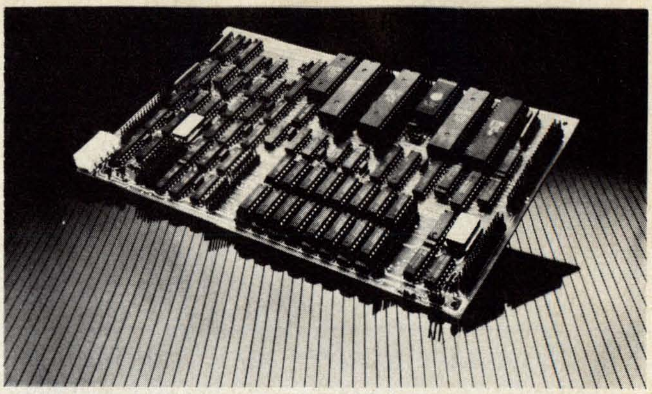
In auto-answer mode, the Visionary 1200 can answer the phone, receive messages and store them in memory for you to retrieve later. Each incoming message is stored in a file named MSG*nn* (where *nn* starts at 01 and increases consecutively to 99, then starts again at 01). The modem's indicator light MSG WAIT starts to blink after the modem receives a message.

Use the LIST command as shown above to see how many messages you have. To read each message on your screen, use the modem's PRINT command:

```
-PRINT MSG01↵
```

You can save the message on your computer's disk by setting up your communications program to capture it as it is displayed on your screen by the PRINT command. Nearly every communications program has this capability.

For example, Modem7 lets you do this by specifying a filename with the `T` (terminal mode) command, then "toggling on" the capture function with Control-`Y`. To turn of the capture of screen text, you use Control-`R` (or Control-`E`). To save the text in a file, you type Control-`E` to return to Modem7's menu, and then you type `WRT`↵.



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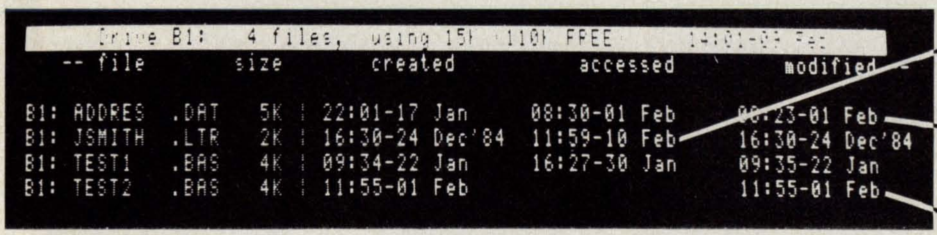

```
        Drive B1:    4 files,  using 15k  110k FREE       14:01-03 Feb
   -- file           size         created             accessed         modified  -

B1: ADDRES   .DAT    5K | 22:01-17 Jan        08:30-01 Feb        08:23-01 Feb
B1: JSMITH   .LTR    2K | 16:30-24 Dec'84     11:59-10 Feb        16:30-24 Dec'84
B1: TEST1    .BAS    4K | 09:34-22 Jan        16:27-30 Jan        09:35-22 Jan
B1: TEST2    .BAS    4K | 11:55-01 Feb                            11:55-01 Feb
```

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Circle 19 — Reader Service Card

The Visionary modem lets you pass messages directly to a printer connected to the modem. This is accomplished with the following command:

```
-PRINTER ON↵
```

After typing this command, any message you display on the screen with PRINT is copied to the printer.

> ***The Visionary modem takes the load of communicating off your computer. With the modem, you don't need a sophisticated communications program.***

Performance

Our first tests were with a pre-release version of the modem; after learning a few features the pre-released version was replaced with an actual production model. The features were not changed, but performance was better. The pre-released version, after using it for an hour, suddenly blurted an answer-mode tone as if it were trying to answer the phone (at the time the line was not connected with the phone line, so no call was coming through; also auto-answer mode was set *off*). This could not be duplicated with the production model, and Visionary tells us that they corrected the problem.

One problem that *should* be addressed, however, is the *default mode* of these modems — the way they are set up as they come out of the box. The Hayes Smartmodem is just as guilty as the Visionary in this respect: both are set up to operate in a mode that causes them to answer the phone if it rings. If you set up the modem and connect it to your computer and phone line without knowing this, you could be in for trouble. The Visionary has no off switch, so you might be inclined to leave it plugged in and connected to your phone line. If you do, and you forget to set auto-answer to off, the modem will answer every phone call with an answer-mode tone.

We think the default should be *not answering* the phone, so that people who simply want modems for calling CompuServe or MCI Mail do not have to also learn how to *turn auto-answer off* when they don't use auto-answer. For those users who have a need for an auto-answer default setting, they could flip a DIP switch (this is how Hayes solved the problem). Of course, this is not a problem if you want the modem to start out in answer mode.

When you first start the Visionary modem, you have to load your programs and phone numbers; they will stay in memory even if power is shut off, unless you type `Y` after the `Clear Memory?` message when you start the modem.

The task of loading the modem's memory is much easier if you write your programs, messages and phone numbers using a word processing program on your computer. You can then upload the programs, phone numbers and messages to the modem from your computer.

We wrote our programs using WordStar on our computer, then used the Modem7 communications program in terminal mode with the Control-`T` command to send the programs to the modem. We had different results with programs, text files and phone numbers. The modem received these files with no problems *but only if Line Feed was set to non-automatic* with the command `SET LF=0↵`. This is consistent with printers, so we see no problem with this except that it should be mentioned in the manual.

Otherwise, performance was flawless. The modem performed every function advertised, without failure and without undocumented "glitches" in the "human interface" (the part you use) other than the ones stated above. The manual is easy to read and fairly organized, but lacks an index and a good summary (the summary provided does not include the SET options). Otherwise, we found good examples in the manual, showing how you can write custom commands (we reproduce one on MCI Mail in the article).

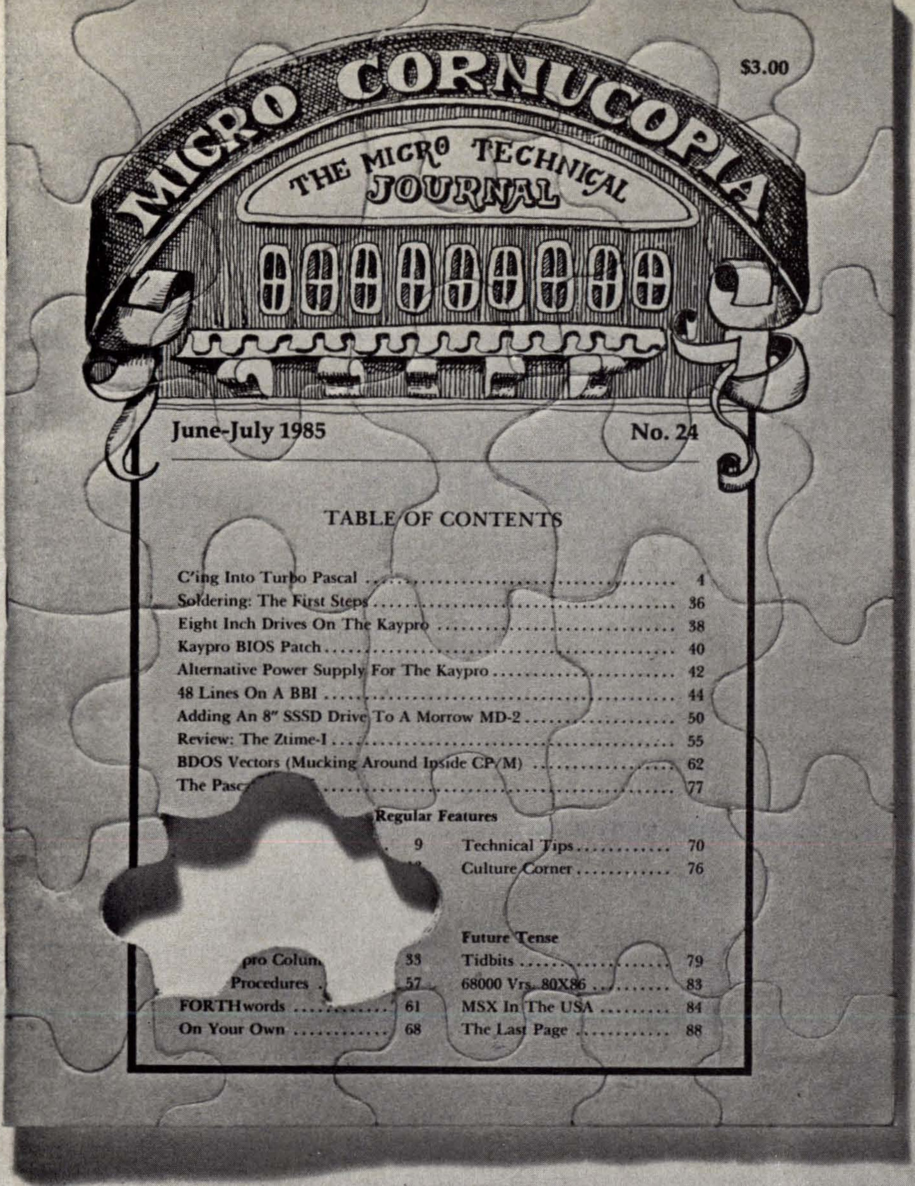
Conclusion

There are a variety of modems on the personal computer market, ranging from simple 300 baud "dumb" modems to intelligent 2400 baud modems and beyond. The Visionary 1200 has all the features you'd need from a sophisticated modem — one that's capable of supporting automatic electronic mail messaging.

Many business and professional users want electronic mail without the expense of a local area network. Visionary modems used in connection with remote computers can supply very basic automatic mail messaging, freeing the computers to do other work.

As a "smart modem", the Visionary is of the breed that supplies more functionality than the Hayes 1200 modem. You can *program* a Visionary to operate by itself, without bothering you or your computer. With conventional communications software you can't have this "modem independence" — the communications software ties up your machine, and you have to resort to a concurrent operating system or a multi-user system to do other work.

The Visionary modem takes the load of communicating off your computer. With the modem, you don't need a sophisticated communications program that remembers phone numbers and log-in sequences. The modem remembers them and handles communication either under your immediate control or under your program's control. For certain users and applications, it's a good value at $495 — an alternative to a "dumber" modem coupled with a smart communications program that together may cost more.



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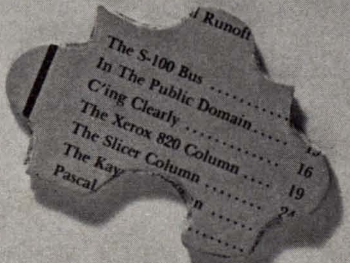

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The Wonders of Turbo Pascal's Typed Constants

Need local variables that retain their values between procedure and function calls? How about automatic variable initialization or accessing components of a string constant?

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This is the first installment of a column describing Turbo Pascal, which is recognized in the industry as a new standard in inexpensive programming languages for personal computerists. Amateur programmers and novices should read the Turbo Pascal tutorials in issues #10 and #15 for background information on using Turbo Pascal.

The *Turbo Pascal Reference Manual* introduces typed constants as "a Turbo Specialty" — which, indeed, they are. Typed constants begin with the notion of an ordinary Pascal constant, but allow much more flexibility and power — letting the programmer to do many things within Pascal that would normally require the use of a systems-level programming language, such as "C", or even assembly language.

Borland International (creators of Turbo Pascal) devised the idea of typed constants because of a number of shortcomings (relative to other languages) in the original Pascal language. Some of the most glaring of these omissions are as follows:

(1) There is no way for a procedure or function to have a "statically defined" local variable (that is, a variable which retains its value between calls). In standard Pascal, the only option is to use a global variable to retain the information — which makes the program harder to read.

(2) There is no facility to automatically "initialize" (set the starting values of) variables when a program is loaded. This often results in large numbers of cryptic assignment statements at the beginning of a program.

(3) The programmer cannot define constants of a user-defined (or "structured") type.

Turbo Pascal's "typed constants" help to take Turbo out of the realm of mere teaching languages, and make it useful for the implementation of tight, powerful, and efficient code.

(4) The components of a constant (such as the individual characters of a string constant) cannot be accessed individually. This makes string processing more difficult.

In this installment we show you how to use typed constants to solve all of these problems, and how to make your code more modular and readable.

What Is a Typed Constant?

The term "typed constant" is at least half a misnomer. Typed constants share with ordinary Pascal constants the property of being initialized when the program starts. However, unlike ordinary constants, a *typed constant's value may be changed during execution of the program.* Thus typed constants are not constants in the true sense of the word (this mutability, however, adds greatly to their usefulness, as you shall see).

Also, contrary to what the name suggests, there is nothing unusual about a constant being "typed" — all Pascal data objects are typed! Perhaps a better name for typed constants would be "structured, pre-initialized, statically allocated variables" — but we will continue here, as Borland does, to call them "typed" or "structured" constants.

Uses of Typed Constants:

More than Simple Types

In standard Pascal, constants can only be of the so-called "simple" types, such as integers, booleans, and reals. Typed constants, on the other hand, can be of any type, including records, sets, strings, or user-defined types. This facility lets you, for instance, define a type for the set of complex numbers as follows:

```
type
   complex = record
             a: real;
             b: real;
             end;
```

You can then define useful constants of that type, such as the "imaginary" number i:

```
const
 i: complex = (a: 0.0; b: 1.0);
```

Note the unusual syntax of the above declaration. In general, the format for a typed constant declaration is:

```
const
 <identifier> : <type> = <structured constant>;
```

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Circle 14 — Reader Service Card

```
program oops;
{$A-}
    {This program demonstrates an important aspect of Pascal: Variables which
    are declared within a procedure do not retain their values between calls
    to the procedure. This behavior is a motivation for the use of "typed
    constants."}

   procedure forget (a: integer; set_x: boolean);
    {This procedure, when called with the parameter set_x = true, sets
    the local variable x to the value passed in a and prints x. Then,
    when called with set_x = false, it attempts to print x. Since local
    variables don't normally retain their values between calls, a
    "random" number will be printed on the second call!}

    var
      x: integer;

    begin {procedure forget}
    if set_x then
      x = a;
    writeln ('x = ', x);
    end; {procedure forget}

   begin {program oops}
      writeln ('We first enter the procedure with a = 42.');
      forget (42, true);
      writeln ('We now enter again, and try to print x:');
      forget (42, false);
   end. {program oops}
```

Output:

```
Running
We first enter the procedure with a = 42.
x = 42
We now enter again, and try to print x:
-17972
```

(Or some other "random" result)

[In certain versions of Turbo, procedure `forget` won't forget the value of `x`; this is due to the way Turbo Pascal allocates space for local variables. Because this behavior is nonstandard, it should *not* be relied upon! -BG]

Figure 1. *An example of the standard Pascal method of "static" variables in which locally-declared variables lose their values when the procedure or function is exited.*

— where ‹structured constant› gives information about the initial value of the typed constant. (The format of this information can be quite complex; for a complete description of what is allowed, see Chapter 13 of the Turbo manual.)

"Static" Variables

In a standard Pascal program, all variables declared within a procedure or function lose their values when the procedure or function is exited. The program in figure 1 illustrates this.

The effect demonstrated by this program can make the construction of certain kinds of programs harder to perform and document. For instance, it is often desired to use a procedure as a "state machine" — that is, a routine which gets passed pieces of data one at a time, does something in response to each piece data, then goes back to "sleep" (remembering where it left off) until it is passed more input.

```
program ok;
{$A-}
    {This program demonstrates the use of a typed constant to give a
    procedure "memory" between calls - a useful facility when building
    "state machines" and
"object oriented" programs.}

  procedure remember (a: integer; set_x: boolean);
     {This procedure, when called with the parameter set_x = true, sets
     the typed constant x to the value passed in a. Then, when called
     with set_x = false, it attempts to print x. Since typed constants
     DO retain their values between calls, x will be remembered
     correctly.}

   const
     x: integer = 0; {All typed constants need an initial value}

   begin {procedure remember}
     if set_x then
        x := a;
     writeln ('x = ', x);
  end; {procedure remember}

  begin {program ok}
     writeln ('We first enter the procedure with a = 42.');
     forget (42, true);
     writeln ('We now enter again, and try to print x:');
     forget (42, false);
  end. {program ok}
```

Output:

```
Running
We first enter the procedure with a = 42.
x = 42
We now enter again, and try to print x:
x = 42
```

Figure 2. *A version of the program in figure 1 using a typed constant for* `x`.

Unfortunately, because a procedure's variables don't "stick around" between calls to the procedure, it is not a trivial matter for the machine to "remember where it left off" — all of its memory is lost! The usual approach taken by Pascal programmers is to store the needed data (called, appropriately enough, "state variables") in one or more "global" variables — that is, variables defined outside the procedure, at the level of the main program.

Global variables, however, present some problems of their own. First of all, many compilers force global variables to be defined far away from the portions of the code that use them, causing great confusion to the reader. (Turbo, fortunately, does not have this problem.) Second, the names of global variables are visible to other parts of the program, which may accidentally change them (especially dangerous if the program has several authors!). Finally, it may be desirable to have a whole bunch of similar "state machine" procedures, with similar state variables, and it is an unnecessary inconvenience to have to make up new names for the state variables each time one is added.

What is really needed here is a sort of "static" variable — one that is "visible" only within a given procedure but does not lose its value when the procedure is exited. Turbo's typed constants fill the bill admirably here, as shown in the program in figure 2.

The program in figure 2, which is (intentionally) almost identical to the one in figure 1, does not suffer from the same "forgetfulness." All that has changed is that `x` is defined not as a variable, but as a "typed constant":

What is needed is a "static" variable — one that is visible only within a given procedure but does not lose its value when the procedure is exited. Typed constants fill the bill admirably.

Why Typed Constants Keep Their Values

Why do a procedure's typed constants retain their values through many invocations, while ordinary local variables do not? The answer lies in the way Turbo Pascal allocates storage for its programs and subprograms.

Virtually all microprocessors, including the 8080, Z80, 8088, 8086, and 68000, allocate temporary storage for information in a part of memory called a "stack." A stack resembles (in structure, at least) the plate dispensers you might see in cafeterias — the top plate is always at the same level, and when more plates are added or removed, the stack adjusts so that the top plate is still easily accessible.

Turbo Pascal uses a similar system when reserving memory locations to hold local variables for a procedure or function. When a procedure is entered, Turbo goes to the microprocessor's stack and "removes" a number of memory locations sufficient to hold the subprogram's variables. The subprogram uses these locations as its variable space, then "returns" them to the stack upon exiting — freeing the space to be used by other operations.

Thus, when the procedure or function is called again later, it is possible (and in fact likely) that its variables will not get the same locations on the stack as it did last time — or that other parts of the program will have used (and changed) these locations in the interim. For this reason, the procedure's local variables should always be treated as "undefined" when the procedure is entered, regardless of what values they may have held the last time the procedure was called.

Typed constants, however, are *not* allocated from the stack, as local variables are. In fact, they are located in a different part of memory altogether: the same area where the program instructions themselves are stored. When the program is loaded into memory from disk, the typed constants come with it — defined and ready to go! And, because the location reserved for a typed constant is never used for anything else, it cannot lose its value when a procedure or function is exited.

Initialized Variables

In a Pascal program, all of the variables are undefined when a program starts, and they remain undefined until assigned a value. However, we usually want at least *some* of our variables (counters, for instance) to start out with known values. For this reason, many Pascal programs start out with a procedure containing tens, perhaps hundreds, of assignment statements designed to accomplish just that!

A large number of assignment statements, perhaps far away from where the variables they initialize are defined, can be *very* confusing. (Where is the definition of the variable that is initialized? How to tell if a variable was left out?) Because Turbo Pascal lets you specify a typed constant's initial value right along with its definition, this "scattering" of information is minimized. And since no assignment statements need to be executed (the value of the typed constant is read directly from disk), the program is smaller and faster as well.

Manipulating Components of Constants

One rarely advertised "feature" of the "standard" Pascal language is that it doesn't like to deal with the individual components of constants — even string constants, which naturally break themselves up into characters. To illustrate this, suppose we define a constant string:

```
const
 test = 'My Very Elegant Mother Just Sat Upon Nine Porcupines';
```

Suppose you wanted to send this string, character by character, to a modem. Suppose also that you have a procedure called `modemout`, which takes a character as an argument and sends it to the modem. One obvious way to program such a task might be the following:

```
var
   i: integer;
         .
         .
         .
for i := 1 to length (test) do
   modemout (test [i]);
```

If you were to compile this example with Turbo, however, the compiler would stop at the last line shown, and complain:

```
Error 5: ')' expected. Press <ESC>
```

Upon pressing the Escape key, you would return to the editor with the cursor on the `[`. Why?

Well, as was mentioned previously, the Pascal language in general does not take well to manipulating the components of constants. In this case, a subscripting operation was being used to pick out a single element of a constant string — but since ordinary constants are treated by Pascal as whole and indivisible objects, this is not allowed.

The answer to this problem, as you may have guessed already, is to replace the "ordinary" constant with a "typed" constant. If the constant definition above is changed to:

```
const
 test: string [52] = 'My Very Elegant (... etc.)
```

— then the program works as expected.

Saving Constant Space

Another side effect of Pascal's simplistic treatment of constants is that they frequently waste space — whenever they are used, they are simply inserted as a whole directly into the compiled code. Thus, if you were to make the following declaration:

```
const
   hello = ''Hello, my name is Frank Borland'';
```

— and then wrote, as part of your program:

```
       .
       .
       .
writeln (hello);
       .
       .
       .
writeln (hello);
       .
       .
       .
writeln (hello);
       .
       .
       .
```

— a new copy of the whole string, "Hello, my name is Frank Borland" would be inserted into the compiled program as part of each one of these statements! In a large program, with many messages, much valuable memory can be wasted in this way.

Fortunately, typed constants can again come to the rescue. If the first declaration above is replaced with:

```
const
 hello: string [31] = 'Hello, my name is Frank Borland';
```

— then each of the `writeln` statements above does *not* generate a new copy of the string; instead, the *one* instance of the typed constant is used for all the `writeln`'s. I have personally seen one program shrink 20K in size after such a change!

A Caveat: Running Programs With Typed Constants from Memory

Recently I spent most of an evening with an experienced Turbo programmer trying to identify an obscure bug in one of his programs. The symptoms:

- The program always ran correctly when run from a ".COM" file.
- The program ran correctly *the first time* when compiled and run directly from memory.
- The program failed to execute properly when run from memory more than once.

After several hours of tracing the values of many variables and typed constants throughout the program, it at last dawned on us what the problem was: Typed constants are *not* re-initialized when a program is re-run from memory.

The reason for this "feature" has to do with the way Turbo allocates memory for, and initializes, typed constants.

When a program is compiled to a ".COM" file, the typed constants are loaded in whenever the program is loaded by the operating system — which occurs each time the program is run. However, when a program is compiled in `Memory`, the typed constants are initialized at the time the program is compiled, and are placed in memory along with the program code. They are not altered thereafter unless the program is recompiled — and are *not* re-initialized when you type `R` (for `Run`) at the main Turbo menu.

The moral of the story: If your program expects typed constants to have a specific value when the program starts (as most do), you must either:

- Compile to a ".COM" file, or
- Force Turbo to recompile your program (by typing `C` at the main menu) between runs.

Conclusion

Turbo Pascal's "typed constants" help to take Turbo out of the realm of mere teaching languages, and make it useful for the implementation of tight, powerful, and efficient code. Borland has added this kind of functionality to Turbo Pascal to make it more useful and to overcome the limitations of the standard Pascal language. As a result Turbo can be used to write programs that would otherwise have to be written in more expensive systems programming languages like "C" in order to be efficient and powerful programs.

Anchor Signalman Express Modem

A surprisingly good modem and fairly good value.

by Byron McKay

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I have to admit it. I have never liked any of the Anchor modem products. In the years that I have been running my RCP/M system, I have had more problems with Anchor modems than any other brand working on the system. But I have to admit that I could have been wrong about the company, with the introduction of the new Signalman Express!

At the outset, let me define some terms to make the reviewing of this particular modem clear and concise. First, there exists a large body of people who are first time modem owners, sometimes referred to as *novices*. Second, novices need all the help they can get using any of the newer high tech toys that have been coming out and third, they need compatible equipment with existing *standards* to eliminate a lot of *wheel re-inventing*. If we keep these facts in mind, I think that the features of this particular modem bear considerable consideration when purchasing, even if you are a new user of modems.

Signalman Express - Ultra Smart 300/1200 Baud Auto Answer Auto Dial Modem is by Anchor Automation Inc. (6624 Valjean Avenue, Van Nuys, CA 91406). Phone: (818) 997-6493

Price: **$439.00** (manufacturers' list price) for a manual and modem. Cables not included, but available from Anchor for several computers.

As I have said in previous reviews, I like to take items, small in size, out on my motorcycle to shake out any bugs that are to be found. Loose connectors and suchlike are immediately shown to be culprits using this method. The Signalman Express seems to have passed this test with little or no effort. Overall construction is fairly high-quality, although not very aesthetically pleasing. Some skimping on connectors is evidenced, but that is to be expected on modems in this price range.

Packaging

Packaging on the modem consists of a box (in shrink-wrap) with custom foam lining to securely hold the modem and power supply. As with most products I have tested, the manual is securely placed at the bottom of the box (when will you manufacturers learn?) under the modem, and no "welcome aboard" card or page is on top when you open the box. I know this is a small bugaboo, but doggone-it, first time users really are lost (in some cases) and need all the help they can get in getting the thing out of the box and setting it up!

The Signalman Express is a well thought out, easily installed and reliable product.

Manual

The manual for the Express could probably best be described as Spartan. There is sufficient information for all needs, with lots of programming information, but there are only two line-drawing illustrations in the whole manual. Installation instructions are up front (where they should be), and quite a lot of effort was put into explaining what cable to plug in where and suchlike. All in all, not my favorite manual of all the modems I've seen, but not a bad manual either. Anchor should make an effort to get a little slicker, and add some illustrations — such as the illustrations on the box, or what all those funny doodads on the back are — for a more effective learning tool.

The Box

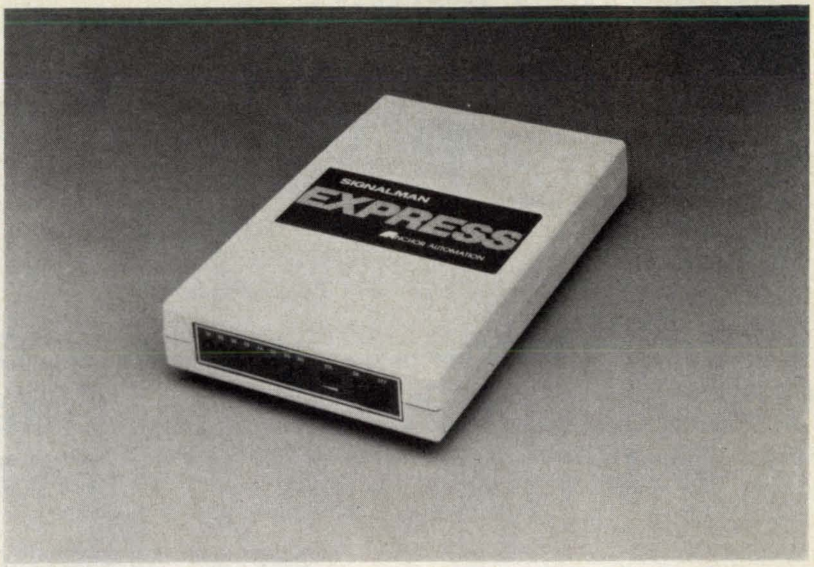
The Express is a basic box in two halves, bolted together with a front panel, rear panel and pop-out top section to provide access to a set of dip switches beneath.

The rear panel contains a pair of RJ-11/12 plugs for connecting the phone to the modem and the modem to the wall. A standard DB-25 connector is provided for the interface to the computer (right on!), and cabling is left up to the individual for his or her machine.

Anchor has several cables available for various machines, I am told. I like that, as it allows we Sysop types to build all those goofy cables required to bring up BBS systems without having to remove someone's soldered in monster (take note U.S. Robotics Password owners).

The power outlet is also on the rear panel, and plugs into the standard wall transformer, transistor radio-type power plug. The front panel has a row of LED indicators which are identical in placement to those on the Hayes Smartmodem 1200. Also up front, two features that I would buy the modem for immediately:

1. A volume control slider knob and
2. An ON/OFF switch.



Yup, that's right! The power switch is on the front! I wish more manufacturers would get this straight — the power switch goes on the front! Good Job Anchor!

At the top of the box, a decorative panel pops out to reveal the DIP switches for setting up the modem. The panel can be a little testy to remove without some sort of prying instrument, or a good set of fingernails, but location is convenient enough to make it a very nice feature. Inside the panel you will find a standard AA battery socket (a battery is even included) which provides the backup power for the Express's ten internally stored telephone numbers for auto dialing.

The DIP switch package is of the good paddle type, but as it is recessed about a half-inch inside the case, the paddle-type switches are a tad difficult to get to with fingers. The switches are tough to move with a ball point pen tip for the same reason. All in all though, with cost considerations in mind, a not unreasonable layout.

I would like to have seen a small stick-on label on the bottom of the panel stating what the dip switches do, ã la US Robotics and Bizcomp — remember Murphy's third law: anytime you need to know something that's in the manual, there will be no manual available — but at least the manual does explain the switch settings.

I like to take small items out on my motorcycle to shake out any bugs. Loose connectors are exposed using this method. The Signalman Express passed this test.

Overall construction is identical to previous efforts by Anchor Automation in quality. Not bad, but not very pretty for office environments. It is tough to assess the quality of a mass-produced product without some bias based on looks, but the Express's *vanilla* looks certainly don't set it apart from all the others out there seeking your hard-earned dollars. Despite appearances, the modem should hold together well and provide years of service.

Features

The Express is *smart*, in that it uses a microprocessor and built-in firmware to allow you to carry out a wide variety of communications functions. It is capable of automatic dial-

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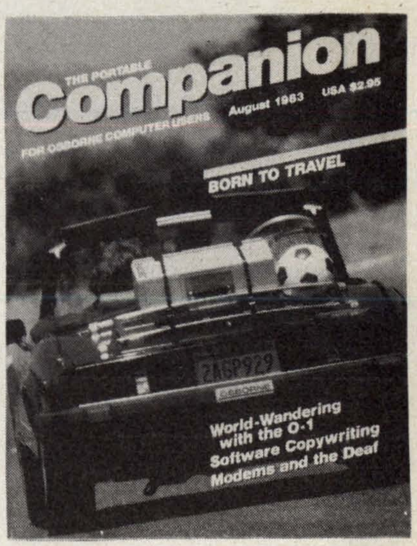
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ing, automatic answering, tone and pulse dialing, dial-tone detection, busy-tone detection, automatic re-dialing, stores a ten phone number memory for dialing with battery back-up, and has a built in speaker for monitoring the telephone line.

The Express makes use of a very standardized superset of the Hayes Smartmodem 1200 series of modems. Compatibility was superb — all software products I tested which use Hayes operating codes operated — with no failures. Even cabling is identical, and the dip switches are identical in function, although in different locations. The superset provides a few new features, such as an on-line menu and retrieving and dialing stored numbers.

The Express is compatible with both 300 baud Bell 103 and 1200 baud Bell 212a standards for data communications. It operates in full duplex or half duplex, with a variety of parity and stop bit settings possible.

The very nicest feature is the built-in command menu which is available whenever you are talking to the modem. Typing `AT?` while in terminal mode on MDM740 will get you a rather substantial menu of information on the modem's operation, including most frequently used commands.

Performance

I have used the Signalman Express for over three months in heavy duty usage — both on my BBS system and with my Osborne Vixen — with great success. Line hits do occur, but not very frequently —at least no more so than with any other modem I have seen (except the Bizcomp). Overall, the modem's line quality seems to be a quantum leap over previous Anchor Automation efforts. It is clear that some effort has gone into cleaning up the older problems the Anchor products seem to have been plagued with, and now I have no qualms in recommending this modem as being as reliable as any on the market.

Overall Impressions

As I said coming into the review, I have never really cared for Anchor's products before, but I have walked away with a changed mind. The Signalman Express seems to be a well thought out, easily installed, reliable product. The minor shortcomings of cheap connectors and poor finish are outweighed by performance and features. I could recommend this modem without question for day-to-day modem usage in a first time user's environment.

I would like to see a better manual, the panel for the DIP switches should be easier to open, and labeling for the switches would be helpful. Overall, not a bad buy at a discount, but the manufacturers' suggested list price of $439.00 may be a little high. I have seen discounting occur on this model in the range of $300-$350, and it should be a fairly good deal at those prices.

Continued from page 51

any of several hundred other fonts). Sample print from this program is available from the company, along with very attractive brochures which explain just what you need to know, and what you need to get started.

Both Fancy Font and NewWord are also available through yours truly (Delphi Data Systems) if your local dealer doesn't have them.

Well, that was a long one, so just one question for this issue! Next issue, I hope to spend a little time on some simpler questions, and get a few more answers out to you all. Until then, keep those cards and letters coming in. Peace!

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Installing WordStar For Epson Printers

The much-sought-after solution to the problem of getting WordStar to do anything neat with an Epson printer.

Semi-Darkness.... The small feeble glow of my CRT and my E.T. Night light the only light sources in the inky blackness.... the low strains of the soundtrack to "2010" playing listlessly in the background from my portable stereo headsets which I am not wearing.... deadlines... am I going to make it?... who cares?.... You do!.... gotta keep going until you have it.... floating on nutrient Twinkie highs... high tech insomnia... I wonder what it would be like if I just set my head down here on the terminal... for just a second.... sleep.

Sound like a night or two you've spent at the console? I wonder how many of us around the country go through the slow agony of using the microcomputer late at night. It's a whole different world at night, late, with a deadline for work to be done. Stale coffee, stale air, the sound of your pillow in the other room calling out your name soft and low, like a siren from ancient greek fable.

Beware the night crawlers of the mind. Those lines of code that look perfect....aren't. That last paragraph that makes sense...doesn't. Those figures added to perfection...no way bucko! I would say that about 50% of all the errors I have ever had on a computer occurred at night, while tired or bored, or both.

Solutions are easy for this particular problem. Plan, rest, and divide. Plan for how much work needs to be done in advance, and set aside fixed times for working on it (I use my alarm watch to alert me that I have done enough at around 45 minute intervals) with a stopping time in mind beforehand. Rest when you need rest! Drooling on your keyboard and waking up with the ASCII character set permanently imprinted on one side of your face may be funny at the moment, but in the long run was just so much wasted time. Divide the project at hand up into good useful portions which may realistically be accomplished with the time frame you have set for the task. The results may be better work done with much less pain on your part, and better health.

Well, so much for sermons for this issue, on to getting results for some of you good folks out there. We have received a few good letters this month, so without further ado...

I would first like to thank all of you

I don't know why WordStar bothers to even include an "Epson" in the menu of printers to install, as MicroPro in their installation has failed to use any of the features that you buy an Epson for.

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WordStar is a registered trademark of MicroPro International.

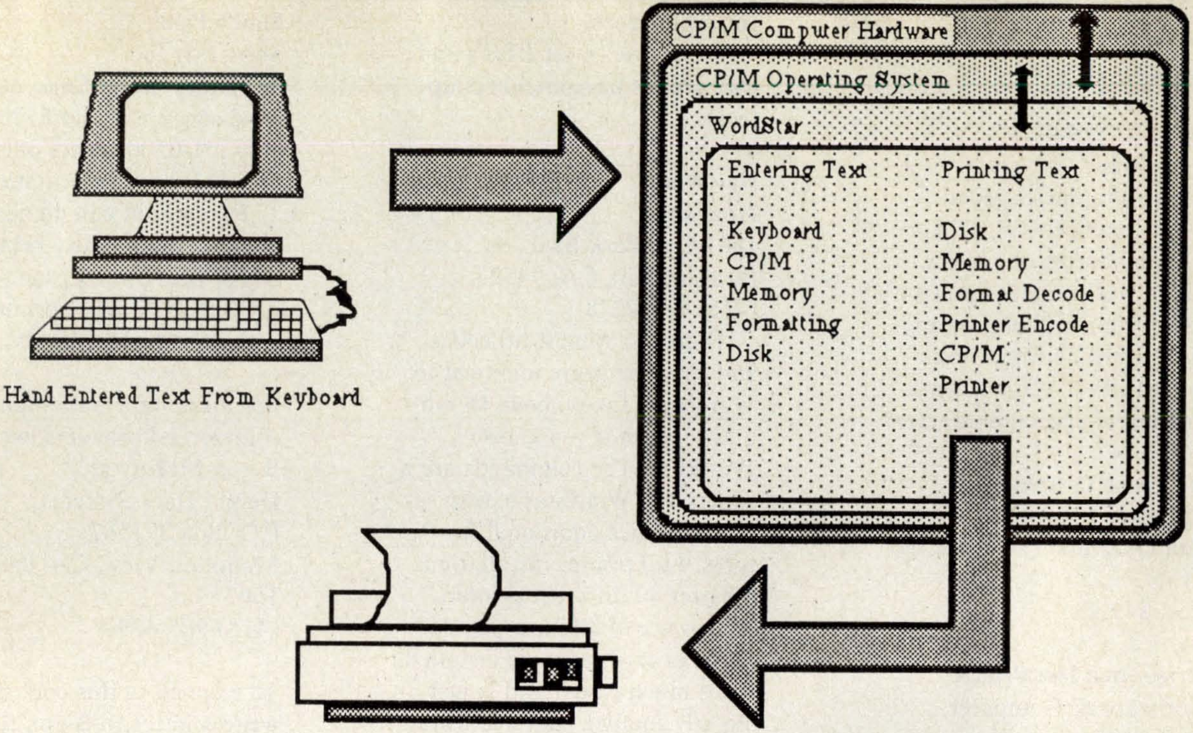


Figure 1. *WordStar and the CP/M computer/printer.*

good folks who have written to encourage me to continue my efforts here. I was pretty amazed at how many questions have come in both at *User's Guide*, and via my own system here at home. It shows what I knew all the time, that many of you are not getting the service you need and so richly deserve from this industry.

My special thanks to Mr. Michael Lopez who correctly points out to me that in the last issue, I incorrectly made mention of the fact that Media Master is not available on the IBM PC and clones....wrongo! Mr. Lopez informs me that Media Master is indeed available and works well on PC look-alikes. Media Master is priced at $39.95 for the PC version, and available from:

DG Systems
23145 Bigler St.
Woodland Hills, CA. 91364
(818) 716-1655

It is also available from several dealers around the country (mine included!). Call the folks at DG for further Info...sorry about that guys. When last I heard, Media Master was not released for the PC, glad to see that it has made it out now! This is what makes the show go here gang, my special thanks to Mr. Lopez for enlightening me!

Question:

I have two problems which I hope you can help me with. I have a Radio Shack DWII printer which I dearly love, but can not find out how to take out the printer-induced linefeed. I do have it working without a linefeed in Wordstar, but can not use it for anything else. When I wrote to Tandy they said to change the ROM and use LPRINT (MBASIC?) commands, and would not answer me if it could be hard-wired out. I did change the ROM's to the tune of $64.00 and it still doesn't work. I said "to hell with Tandy" and sold my Model IV.

If your printer is not on WordStar's installation menu or, you have an implementation that does not meet your needs, you may need to patch-in your own codes using these methods.

Second problem is when I purchased the 6300, I also bought an FX80 (Epson) printer and the salesman told me it would work double strike for the entire letter and underline somewhere in the letter, yet it changed from double strike to single strike. With the sub-scripting and super-scripting it advances 1 full line. I have tried to reinstall it as a specialty printer without success. I hope you can offer me some advice. When I wrote to Epson asking them how to install the printer for Wordstar, I got a note telling me the printer had to be installed! No Kidding!

Gil Seiler
Santa Rosa, CA.

Answer:

Gil, it sounds to me like a case of NIH Syndrome. As in "Not invented here." Radio Shack has long been a culprit of selling daisy wheel printers designed to go with main-frame type computers or printers with just poor

Flashprint
Flashprint Software
P.O. Box 2179
Daly City, CA. 94017
(415) 994-8282

Installs: graphics, special characters, compressed, proportional, expanded, elite, italics, pica, subscript, superscript, true underline, color ribbons, or any combination of above. Also includes a utility to allow downline loading of special character sets.

For: Epson Graphtrax (MX,FX,RX,LX series), Okidata Okigraph (80 series, 90 series)

Price: $49.95.

Printerizer and HexPrintR
C.I. Software & Computer Products
1380 Garnet Ave. E149
San Diego, CA. 92109
(619) 483-6384

Installs: Varies with printer, imbedded graphic codes, revised menus.

For: Epson RX/FX, Epson Graftrax 80, Gemini 10/15, IDS Prism, Okidata 80 series, Okidata 90 series, Brother Hr-1, Comrex CR-1, C. Itoh Prowriters, NEC PC-8023a, DMP-85.

Price: $35.00 for Printerizer, $55.00 with HexPrintR, $39.00 for HexPrintR alone.

ROFF.COM
Sig/M, FOG, or
other user group,
or Byron McKay's
Mountain View RCP/M
(415) 965-4097

File Run Off program which takes a file from any editor or word processor, and using special embedded codes, toggles the printer output to pretty things up. Source is in "C", and many flavors are available on most BBS systems around the country. This one is a nice alternative, since you don't have to learn anything new to use it as far as you editor goes.

Price: free (most BBS's and user groups have membership fees).

NewWord
NewStar
1601 Oak Park Blvd.
Pleasant Hill, CA. 94523
(415) 932-2278

Features: Almost all codes and commands are identical to WordStar. Takes about 15 minutes to learn if you know WordStar. The commands are a superset of WordStar's, with several very nice additional features. Full printer installations for over 40 different printers. Makes use of all most popular features of all printers installed. Runs much faster, and is just slightly smaller than WordStar. Includes the Word+ Spelling Checker in the price tag for CP/M machines. IBM compatible version available also.

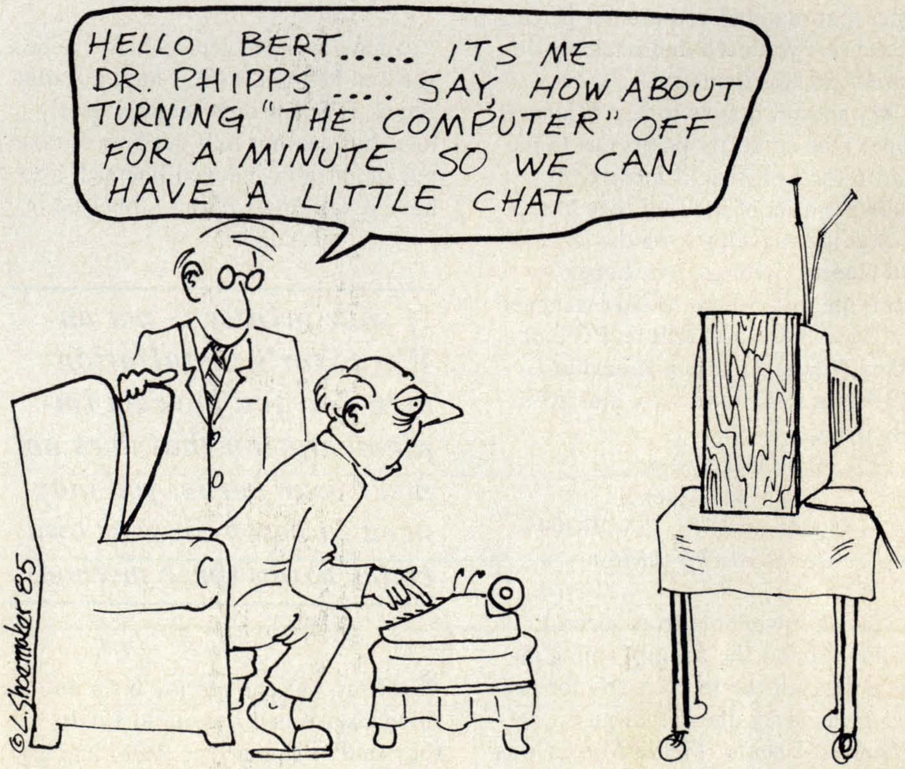
Price: $150.00 with Word+

Fancy Font
SoftCraft Inc.
222 State Street Suite 400
Madison Wisconsin 53703
800-351-0500 orders only
608-257-3300 Information

Fancy Font can do near-phototypeset quality printing on any of the newer Epson FX/RX/LX series printers, with plenty of typefonts.

For more information on the commercial products, write to Byron McKay at:
Delphi Data Systems
P.O. Box 391567
Mountain View, CA. 94039-1567
(415) 965-4090

To respond to this column or write a letter to Byron for this column, write to:
User's Guide
P.O. Box 5245
Redwood City, CA 94063
(415) 367-1029/BBS


HELLO BERT..... ITS ME DR. PHIPPS .... SAY, HOW ABOUT TURNING "THE COMPUTER" OFF FOR A MINUTE SO WE CAN HAVE A LITTLE CHAT
©L.Shoemaker '85

design implementations for consumers with microcomputers.

There is no known hardware fix (that I know of) for that particular printer, as the line feed mechanism is tied to the carriage return mechanism in the ROM routines used by the machines. It is true that you can run an MBASIC or other BASIC program and use the CHR$() function to send character strings to the printer to eliminate the extra line feed, but what a pain. Since it sounds like you have already gotten rid of the equipment anyway, I think you probably solved it the best way.

On the subject of Epson printers being installed in WordStar, it is a fairly large project to perform the installation, as you have to be aware of several things, making it difficult at best. It may take a while to get the subject down, but here goes.

First off, let's look at how WordStar talks to the printer. Take a look at figure 1, which shows how the text you type into the computer is routed through the machine, and out to your printer. Pay particular note to the fact that CP/M and WordStar both talk to each other bi-directionally, continuously to get the job done. Also, note that the sequences shown for entering text, and printing text look a lot like inverse functions, but aren't. Notably the "Format Decode" and "Printer Encode" steps do not appear in the "Entering Text" sequence.

As you can see, you type in text (ASCII) from the keyboard, which WordStar then holds either in memory (if small enough) or on disk (if too large for memory). Formatting the paragraph widths, the type of print you want, and the way the text looks all occurs as you enter the Control-P and other commands which re-format your text. All of these formatting commands are stored as integral parts of the text, using special ASCII characters to provide the coding for margins, print characteristics and such like. All of these codes combined with your text are stored on disk at the end of the editing session.

When print time occurs, WordStar checks for imbedded print commands which it then converts to the necessary ASCII codes needed by the printer to perform the equivalent operation on the printer, and then sends the needed codes to set the printer back on the correct output for "normal" operations when done. It is the coding portion of the problem which is difficult, as one wrong code, or a code not understood properly, can cause the whole thing to operate poorly.

Coding for any given printer may be stored internally in the WS.COM file, using the installation routine, DDT, or overlaying a hexadecimal file with the codes and address corresponding to the correct codes and addresses for your printer. If your printer is not on WordStar's installation menu or, you have an implementation that does not meet your needs, you may need to patch-in your own codes using the methods above, or by hand.

The codes needed for the printer to operate correctly *may* be patched in some cases to provide more of your printers' capabilities than what WordStar provides out of the box for your printer. In the case of the Epson, I don't know why WordStar bothers to even include an "Epson" in the menu of printers to install, as MicroPro in their installation has failed to use *any* of the features that you buy an Epson *for*. MicroPro (maker of WordStar) is at fault here, not Epson.

To complicate matters further, MicroPro has changed the way in which printer installation occurs with each new version of WordStar, making step by step instructions for all versions too large to include here using the built in installation routines. So, we'll have to get our hands dirty, and maybe learn something along the way, or spend some money.

First things first: let's talk about

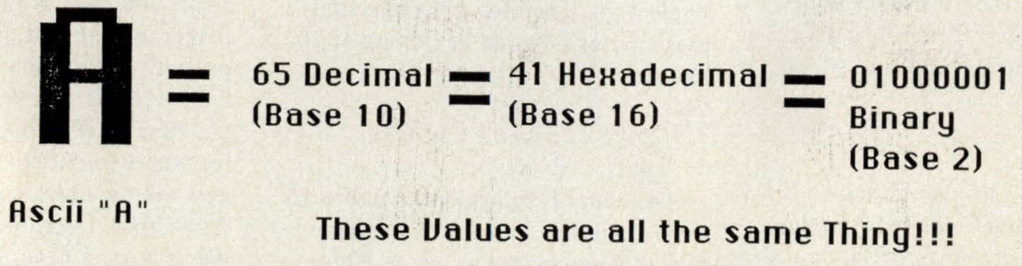


Figure 2. *Decimal/Hexadecimal/ASCII comparison.*

ASCII, Decimal, and Hexadecimal number systems and notation. This may be old hat for some of you, but I think it should be reviewed before we start this particular project. Take a look at figure 2, while we discuss the basic ASCII codes, and how they relate to our standard decimal and hexadecimal numbering systems.

At the lowest echelon we have binary. This is what your computer speaks internally to all its devices. Binary is how everything, repeat, *everything* moves around. Binary for the letter "A" (note that is a capital "A") is:

```
0100 0001
```

Ok, so what? Well, if you had to write that down a couple of thousand times a month, you might make a few errors after a while. It is inconvenient to work with. So, you could also express a capital "A" as a decimal number (our normal day to day numbering system) like so:

```
65
```

Fine. Now we have a number which shares little or no relation to the binary number as far as looking alike, or having similar characteristics of any kind, so although more businesslike, it is still not the best notation to work with. Also, larger ASCII values get bulky to work with (like 127 for the letter W) and take up more work to keep track of in the long run.

So how about a numbering system which bears a relationship to the binary that is actually moving around, is short in format, and uses fewer digits in a logical manner? Enter hexadecimal. The hexadecimal capital "A" is:

```
41
```

Broken down, this can be shown to have a relationship to the binary number as follows. Let's work out a binary number's "places" (remember the one's place, ten's place, hundred's place etc. from our own base 10?), and annotate them for reference:

```
8 4 2 1  8 4 2 1
0 1 0 0  0 0 0 1
```

Note that I broke the binary value into two distinct four bit values, and annotated the "places" using only the 4th power and below on each. This is to form what used to be know as "nibbles" of 4 bits each, making conversion to hex and back again simple.

Now, looking at the first or "high order" nibble, note that the 8,2, and 1's places are all 0, with the 4's place being a 1. This would make the value of the "high order" nibble equal to 4. The "low order" nibble would be equal to 1 since only the one's place is at a "1" value. Therefore, the Hexadecimal value of capital "A", or 65 decimal, or 01000001, is 41. Or more simply

```
8 4 2 1  8 4 2 1
0 1 0 0  0 0 0 1

   4        1
```

Converting to the decimal is easy once you know the hex, as you merely take the "high order" nibble and multiply it by 16, and take the low order nibble and add it to that value. Ok, a problem arises, since it becomes obvious that if you add all the places up, you will get a number over 9, the largest number that we are all familiar with in our own decimal system as a single digit. Therefore, hexadecimal uses a letter notation beginning at 10, like so:

```
0 1 2 3 4 5 6 7 8 9 A B C D E F
```

There are programs that know how to talk to WordStar to install various makes and models correctly, without the user having to know how to do patching.

The above is equivalent to 0 thru 15 in decimal. Ok, make sure you have this all wired before we go on. Once you have a handle on what the three numbering systems — ASCII, decimal, and Hexadecimal — are all doing to binary, then you are ready to read your printer manual.

As was pointed out, the ASCII "A" can be expressed by any of the three numbering systems shown above. Any ASCII code may be expressed in any of the numbering systems shown. WordStar allows you to enter values (in later versions) for each of your printer's basic characteristics in either hexadecimal, decimal, or ASCII (by typing the actual letter or key itself). For those with WordStar versions 3.00 and above, your installation routine will even prompt you for these answers for each of your printers capabilities. Users of older versions, will have to rely on our old friend DDT to patch in new hexadecimal values (hex only in DDT!).

Once upon a time, MicroPro International provided a document called the "WordStar Customization Notes" which contained all of the locations for patching WordStar to do all sorts of things. At first, the manual came out with a price tag of $500.00 (the same silly price as WordStar), available to OEM (original equipment manufacturers) only, and after so many people complained about the price, was lowered to $60.00 (still no bargain), which did little to make its use widespread.

Finally, after a great deal of complaint by average customers, a $29.95 version was released, but was not available for later (version 3.3x) versions, and now, as far as I know is no longer available at all due to the "improved" installation routines for the 3.3x versions. The net result is that you have to do some looking around for where to patch what. I would suggest taking a look at the November/December 1984 issue of *The Portable Companion* #14 pages 24 and 25 for a more complete listing, but I will put a short listing here for your convenience. But first let's talk about your printer.

Now, your printer manual may express your codes for given operations in any of the numbering systems mentioned. When working with DDT, or equivalent, you will have to convert any codes not in hex to hex. Figure 3 shows an example of an Epson FX-80's codes (just a few of the many codes that can be used...hopefully the most popular features), already converted to hexadecimal. You would use these values to respond to the questions asked by WordStar's "custom printer installation" selection on the main menu of WINSTALL.COM for newer versions, or provide the needed codes to be patched into WordStar with DDT.

To make use of the printing features, first decide what command you want to cause what printer operation, and patch the locations using DDT.

Where do I patch them you ask? Well, again, since WordStar has changed so many times, it is hard to show a complete listing in the space allowed here, so I may not be able to show all locations in my listing. In each case, the address of the patch is the beginning of a "string" of characters which WordStar will send to the printer verbatim. The only exception to this is that the first character of each string is a hex value for how many characters are in the string total (not counting the lead character itself). Some strings do not need the lead character (nothing like consistency, huh folks?) especially when the string consists of only on character.

For example, WordStar might have values for initiating the printer which look like this:

```
02 1B 3D
```

— where `02` is 2 bytes to be sent to the printer, and `1B` is an Escape key, and `3D` is the "=" (equal sign) ASCII character. Again, all are ASCII characters, expressed in hex.

A value for the strikeout character however, might have only:

```
7F
```

— for its entry. Confused? Well, study it for a moment and it should clear up, but this could be made easier (MicroPro, are you reading this?).

Table 1 shows the patch locations of the printing codes for the most common versions of WordStar. This is just a partial listing of a very large number of patchable locations which can be used to patch WordStar. All you have to do to make use of them is decide what command you want to cause what printer operation, and patch the locations using DDT. Again also, depending on the version of WordStar involved, you may or may not be able to make use of all of your printer's codes, due to the length of the codes, or WordStar's mode selections which turn off some of these features (notably selections known as "specialty printers" by MicroPro), causing them to not be available at all.

Using DDT is quite simple really. You should find it on your original CP/M disk which came with your system. If you didn't get one of those, or don't have a DDT.COM on any of your disks, fear not! Call FOG (415-755-2000), one of the largest CP/M-oriented user groups (the main office is in Daly City California) and find out about membership in the group, and how to get what is called the "FOG Starter Disk" from them. It is a disk filled with public domain (free) software and contains a program called EDFILE.COM which has the same function as DDT.COM but much simpler to use.

To patch WordStar with DDT, merely place DDT and WordStar on the same disk (make sure you have WordStar backed up somewhere in case you blow it!) and type the following command:

```
A>DDT WORDSTAR.COM↵
```

DDT will now come back with a login message which looks something like:

```
DDT Vers. 2.2
Next  PC
XXXX  XXXX
-
```

Ok, the `x`'s on the left indicate the next "page" in memory after the last byte in WordStar. If the right two digits end in 0 thru 8, subtract 1 from the left two digits. If the right two digits end in a number greater than 8, leave the left two digits alone (remember A-F in hex is equivalent to 10-15 in decimal!).

Now, convert the left two digits to decimal (remember our hex/decimal lesson) by taking the left digit and multiplying it by 16, and then adding it to the right digit multiplied times 1.

Confused? Here's an example:

```
DDT Vers. 2.2
Next  PC
3CE0  0100
-
```

Here, the right two digits are E0, which ends in 0, so we subtract 1 from the left most digits (3C) leaving 3B. Then, we convert 3B to decimal:

```
  3      B
 x16     x1
 ----------
 48      11
```

Note that `B` in hex is equal to 11 decimal. Now, add them together to obtain 59 decimal, which is the number of pages to save when we are done with this mess. Depending on the version of WordStar, this number should be between 63 and 76 decimal; if not, try again!

Now we can begin the actual patching. The - (dash) that you see with DDT is the equivalent of the `A>` prompt you see with CP/M itself. It is signalling that it is ready to go. So here are the commands which DDT normally uses to do about 90% of all work. (There are more commands, these are just the most frequently used. See *User's Guide* issue #8 for a tutorial on using DDT to patch programs and SAVE to save the result.)

`D` Display hex bytes. `D0100`↵ would cause DDT to display hex bytes beginning with memory location 0100 hex. `DF000`↵ would cause DDT to display memory in Hex starting at F000. The display is one screenful at a time, and annotated on the left side, with the address of the first byte in each line.

`S` Substitute value(s). S100 would cause DDT to enter a sort of "line editor" which first shows you what is at memory location 0100, then waits for you to input a new hex value, and then increments to the next memory location to repeat the process over and over again. Typing a . (period) at any hex location will abort the editor.

^C (Control-`C`)
Stops DDT and puts you back into the operating system.

Now, let's patch just one code (the procedure is the same for all codes) of the Epson's print functions into our Wordstar:

```
A>DDT WS.COM↵

DDT VERS. 2.2
NEXT  PC
4889  0100
-
```

At this point, write down "72 pages" as the amount to save — don't forget it! Then we use the `S` command:

```
-S06CF↵
```

— The start of the `^PQ` command string.

```
06CF 00 1B↵
0CD0 00 53↵
0CD1 00 31↵
0CD2 00 .↵
-
```

TABLE OF POPULAR WORDSTAR PRINTING FEATURES

COMMAND: `^PB`

Label Name	2.26 Location	3.30 Location
`Bldstr`	`0691`	`069A`

Determines the number of times to print over boldstrike text to achieve the bold effect. Use fewer strikes with Epson letter quality modes, as it gets smeared.
Default values: `03`

COMMAND: `^PD`

Label Name	2.26 Location	3.30 Location
`Dblstr`	`0692`	`069B`

Determines the number of times to print over double strike text to achieve the effect. Again, use caution in changing above defaults if using letter quality texts.
Default values: `02`

COMMAND: `^PA`

Label Name	2.26 Location	3.30 Location
`Palt`	`06B5`	`06BB`

String to send the printer into alternate pitch. May and should be used for things like turning on compressed print, since on most dot matrix this is the only alternate pitch used. Cancel and return to normal codes are located in `Pstd`.
Default values: `00 00 00 00 00`

COMMAND: `^PQ`

Label Name	2.26 Location	3.30 Location
`Usr1`	`06C9`	`06CF`

User definable code 1 of 4 available. Can be anything you want the printer to do. I use 1 to turn on superscripts, 2 to turn on subscripts, and 3 to turn off both.
Default values: `00 00 00 00 00`

COMMAND: `^PW`

Label Name	2.26 Location	3.30 Location
`Usr2`	`06CE`	`06D4`

User definable code 2.
Default values: `00 00 00 00 00`

COMMAND: `^PE`

Label Name	2.26 Location	3.30 Location
`Usr3`	`06D3`	`06D9`

User definable code 3.
Default values: `00 00 00 00 00`

COMMAND: `^PR`

Label Name	2.26 Location	3.30 Location
`Usr4`	`06D8`	`06DE`

User definable code 4.
Default values: `00 00 00 00 00`

COMMAND: `^PY`

Label Name	2.26 Location	3.30 Location
`Ribbon`	`06DD`	`06E3`

Normally used to change ribbon color on printers which can do this; I use it for turning on underlining, and use Riboff to turn it off.
Default values: `00 00 00 00 00`

Table 1. *The locations of printing codes for the most common versions of WordStar.*

COMMAND: `^PY`

Label Name	2.26 Location	3.30 Location
`Riboff`	`06E2`	`06E8`

Normally used to change ribbon color back to normal on printers which can do this, but I use it to turn off underlining.
Default values: `00 00 00 00 00`

COMMAND: automatic, no command

Label Name	2.26 Location	3.30 Location
`Psinit`	`06E7`	`06ED`

An initiating string. Use this string to establish how you want your printer to default on coming into WordStar. For example, I use it to set letter quality mode on my Panasonic, with 12 cpi spacing.
Default values: `01 0D 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00`

COMMAND: automatic, no command

Label Name	2.26 Location	3.30 Location
`Psfini`	`06F8`	`06FE`

This is the inverse of `Psinit`. Use this string to re-establish how your printer looked before you came into WordStar. Like setting 10 cpi, draft mode etc.
Default values: `00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00`.

Table 1. *The locations of printing codes for the most common versions of WordStar.*

Now, what we did there, was "substitute" values starting at hex location `06CF` in memory, which is the beginning of the string which will be sent by the `^PQ` command (`usr1` label above), and the string `1B 53 31` which causes the printer to shift into the small subscript font (see figure 3). The period (.) at the end, ended the input of those bytes. Now, let's save what we have done.

```
-^C
```

— This exits to CP/M.

```
A>SAVE 72 WS.COM ↵
```

The above SAVE command saves the newly-patched version of WordStar (remember the 72 pages you were supposed to write down in the last example?).

WordStar has now been patched so that when a `^PQ` is entered surrounding text, that text will be printed in subscript form, and saved it to disk, to be used again and again. Remember to patch the other bytes for superscript, and to turn off sub/superscripts, or your text will stay in superscript from now on! Just repeat the procedure shown over and over, testing each new feature as you add it, to see if it works!

As you can see, this method is complex (not really, but enough to snow most novices) so here are some other suggestions on how to get more printer features, with much less work:

Purchase any of several WordStar to printer install programs. These are programs that know how to talk to WordStar to install various makes and models correctly, without the user having to know how to do patching. Two products come to mind (although I am sure there must be around ten or so on the market), and their names and addresses are listed in the "data box" accompanying this column.

An even better solution is to invest in another word processing program that supports more printers and all of the printer features. One alternative in the public domain is ROFF.COM, which takes a text file created by any editing program and prepares it for printing using special printing codes. Another alternative is NewWord from NewStar. NewStar has shown a marked tendency to continue to support 8-bit CP/M users with phone support, new versions, and ready availability. I sell it (Delphi Data Systems), as my recommended word processor, and have had excellent service all round! This and others are also listed in the "data box".

Beyond a doubt, the best solution for using all the power of an Epson printer is a product that offers speed, convenience, and power: Fancy Font. Fancy Font is similar to ROFF.COM as described above in that it is a "post-editing" print-off utility. Fancy Font can do near-phototypeset quality printing on any of the newer Epson FX/RX/LX series printers. There are more fonts available for this product than any other product I have seen, including the Macintosh!

Codes are entered into the text, using simple backslash commands; `\f0`, for example, switches to "font 0" which you might have set to an Helvetica 10, or an Old English 18 (or

Continued on page 43

LIST OF POPULAR EPSON PRINTING CODES

Action	Code
Print subscript font	1B 53 31
Print superscript font	1B 53 30
Turn off superscript/subscript fonts	1B 54
Set underline on	1B 2D 31
Set underline off	1B 2D 30
Set compressed 15cpi print	0F
Release compressed print	12
Set expanded 5cpi print	0E
Release expanded print	14

Figure 3. *Some of the popular Epson FX80 printer codes in hexadecimal.*

dBASE REPORT/Miriam Liskin

Problems With The Editor and SKIP

Although upgrades are somewhat expensive, you may want to do it anyway after reading about problems with dBASE II version 2.3.

In the last issue you learned some of the ways that your dBASE II data base files can be corrupted. This installment moves on to some of the destructive bugs in dBASE's program editor.

The dBASE II editor is invoked by typing `MODIFY COMMAND`↵ at the dot (.) prompt. MODIFY COMMAND gives you access to the standard dBASE II full-screen editing facilities so that you don't have to buy a separate editor or word processing program just to write dBASE II command files. If you already have a word processor which can read and write standard ASCII files, you will probably prefer to use it for writing large programs, but the dBASE II editor is still handy for making small changes or bug fixes without having to get out of dBASE, load the word processor, and then get back into dBASE.

dBASE II version 2.3 has several serious problems which can damage your command files. Occasionally, after a session with MODIFY COMMAND, parts of a data base file may appear in the middle of a command file. You can prevent this by always closing all open data base files (using CLEAR or USE) before beginning to edit a command file.

You should also use the CLEAR command (type `CLEAR`↵) to cause dBASE to write the edited version of your command file to the disk when you are finished (make sure you have first saved any memory variables you'll need later). Even though typing Control-`W` "saves" the command file, dBASE may be retaining the file in a memory buffer rather than writing it to the disk immediately, and this can get you in trouble.

If, for example, you immediately try to run the program, dBASE will reload the program — the older version, before your most recent editing session — from the disk. If you have "saved" a program using Control-`W` and then realize right away that you need to make another change in it, the file will also be reloaded from the disk, and it will appear that your first set of changes were never saved. An even more insidious danger is that you may not notice that you are re-editing an older version of your program. If you go on to make your second set of changes, and then CLEAR, or QUIT, the newer changes will be saved, and the first set will be lost forever. This kind of seemingly random, quirky behavior can lead you to question your own sanity! The moral is: use CLEAR right before and right after a session with MODIFY COMMAND.

The 16-bit dBASE 2.3 has a bug which may show up in any of the full-screen editing commands, including MODIFY COMMAND. If you type Control-`C` a couple of times in rapid succession — either because you want to move forward two screen "pages" in the file, or simply because your finger lingered too long on the key, causing the command to repeat — dBASE will dump you unceremoniously back to DOS, without properly closing any open files. This bug has been corrected in version 2.4.

dBASE does not load all of a long command file into memory at once: like many word processors, it loads the first chunk of your file, and then reads more text from the disk as needed. This works fine as you move forward through the file, but if you try to go backward beyond the portion of the file currently in memory, the disk buffer is not handled properly. You may lose a portion of the file, or dBASE may dump in some "garbage", which may not be visible in MODIFY COMMAND, but which may prevent the program from executing. If you have another editor which can display the full extended ASCII character set, you'll be able to see (and delete) the damaged area. File handling has been improved in version 2.4, but it's safest not to back up more than a screen or two using MODIFY COMMAND — instead, save the file, type CLEAR, and then re-edit.

With version 2.3, it can be dangerous to use the dBASE editor, but if you have version 2.4 it can be dangerous *not* to use it. dBASE 2.4 assumes that all command files have been created using MODIFY COMMAND, which apparently saves files in 128-byte chunks. If in fact you have written your programs with a word processor, dBASE may not recognize the end-of-file marker, and may truncate the file, chopping off the last partial 128-byte block. This has been corrected in version 2.41, but if you have 2.4, you can simply put a couple of lines of extra text at the end of each command file. Just make sure each line begins with an asterisk (*) — dBASE's comment marker.

With version 2.3, it can be dangerous to use the dBASE editor, but if you have version 2.4 it can be dangerous not to use it.

Problems With Program Statements

So far we have discussed dBASE bugs commonly encountered in command mode. As you might expect, the dBASE program interpreter has its own set of problems, and beginning dBASE programmers may be surprised to discover that the same dBASE commands may behave quite differently when issued from within a program than they do when you type them at the dot (.) prompt. This is especially frustrating if you are trying to trouble-shoot a program's logic by typing the commands one by one at command level.

In early versions of dBASE, attempting to SKIP beyond the end of a file from within a program could have disastrous consequences. At the dot prompt, if you are positioned at the last record in the file, and issue a SKIP command, the dBASE record pointer will simply remain at the last record and the EOF function will be set to `.T.` (true). Similarly, if you are at the top of the file, the SKIP -1 command will leave you positioned at the first record, although in this case, in contrast to languages like BASIC, EOF will be false.

The same SKIP commands in a dBASE program will cause "garbage" from dBASE's memory buffer to be dumped into your file. In most cases the index will be corrupted, and the resulting `RECORD OUT OF RANGE` message may be your first indication that anything has gone wrong. If you examine the data base file, you will find records containing part of the text of the program itself (from the vicinity of the offending line, which may give you a clue as to where to look for the problem). This bug was corrected in version 2.3D (not, as stated in the Ashton-Tate bug list, version 2.3B).

If you are working with an early version of dBASE, you will have to make sure that your programs never try to SKIP to a record beyond the end or before the beginning of a data base file. You can't just use the EOF indicator for this purpose: the EOF test won't help you at the beginning of the file, and at the end, it won't have the value `.T.` until the damage has already been done. Instead, you will have to identify the first and last records in the file (or in the index, if you are using an index). You can do this by storing the appropriate record numbers to memory variables:

Continued on page 59

Two Computers ?

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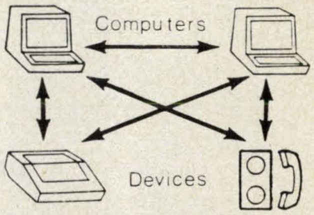

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Circle 27 — Reader Service Card

New Products

CP/M computers, software, communications products, networks, peripherals and accessories.

Computers and Systems

Commodore 128

Commodore International, Ltd. has started shipping their 128PC computer with CP/M 3.0 (CP/M Plus), and announced availability of the popular Perfect Software series by Thorn EMI Computer Software Inc. — Perfect Writer,® Perfect Calc® and Perfect Filer®. These programs feature pop-up menus in simple English, split screen windows and automatic formatting for printing. Perfect Writer contains a built-in spelling checker, a thesaurus and powerful editing features. The Perfect series operates under CP/M in 80 column mode on the 128 — additional Perfect series titles are under development.

The new Commodore 1571 disk drive is capable of reading most CP/M formatted programs, though it first boots up in IBM system 34 format. It is double sided and stores up to 410K in double density format. It is format compatible with the Kaypro and Osborne computers, and can be daisy chained with other peripherals. In addition to the Commodore 128, this drive works with the Commodore 64, Plus/4 and LCD computers.

Other new peripherals include a monochrome monitor (1901), an RGBI/Composite color monitor (1902), two modems (1660 — 300 baud, 1670 — 1200 baud), and the Commodore mouse.

The 128PC computer has a RAM disk option to expand the 128K RAM to 512K, user selectable 40/80 column full color display and the ability to run off the shelf software such as WordStar and dBase II. Commodore is actively working with third party software developers to utilize the computer's new capabilities.

The 128PC and peripherals are available through retail outlets nationally. For more information, contact Frank Leonardi, Vice President of Marketing, Commodore Business Machines Inc., 1200 Wilson Drive, West Chester PA 19380.

Circle 51 — reader service card.

CompuPro 10 System Backup Support

Viasyn Corporation, formerly known as CompuPro, has an optional 10 Mbyte tape cartridge drive available for its CompuPro 10 Plus multiuser microcomputer system. The tape drive replaces one of the floppy disk drives in the CompuPro 10 Plus enclosure, and has a "start/stop" feature so the user may back up selected files.

The tape drive option can be ordered simultaneously with a CompuPro 10 Plus system and is priced at $825. The tape drive option is available as an upgrade to installed CompuPro 10 Plus systems for $1095.

For more information, contact Viasyn, 26538 Danti Court, Hayward, CA 94545.

Circle 52 — reader service card.

Avatex 1200
M O D E M

The Avatex Modems are available in 300, 600 and 1200 baud models.

Modems

Avatex Modems For Non-Techies

E+E DataComm has three new modems, Bell and Hayes compatible and easy to use, available through retail outlets at competitive prices. The Avatex 300 is 300 baud and costs $64.95, the Avatex 600 is 600 baud and costs $99.95 and the Avatex 1200 is 1200 baud and costs $299.95. They offer features such as binary, serial and asynchronous operation at variable speeds up to their specified maximum baud rates. They work with most personal computers using an RS-232C connector. They automatically adjust to incoming baud rates, and are compatible with touch or pulse-dial telephones.

The Avatex 300 has manual originate and answer modes, while the 600 offers low (Bell 103/113 compatible) and high speed modes, auto answer and auto disconnect features. The 1200 baud Avatex offers full duplex automatic/manual originate, answer

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WALTZ LISP

The universal, superefficient LISP for MS-DOS and CP/M.

Waltz Lisp is a very powerful and complete implementation of Lisp. It is substantially compatible with established mainframe Lisps such as *Franz* (the Lisp running under *Unix*), *Common Lisp,* and *MacLisp.*

Ultra fast. In independent tests, **Waltz Lisp** was up to twenty(!) times faster than competing microcomputer Lisps.

Easy to use. Built-in WS-compatible full-screen file editor. Full debugging and error handling facilities are available at all times. No debuggers to link or load.

Practical. Random file access, binary file support, and extensive string operations make **Waltz Lisp** suitable for general programming. Several utilities are included in the package.

Full Lisp. Functions of type *lambda (expr), nlambda (fexpr), lexpr, macro.* Splicing and non-splicing character macros. Full suite of mappers, iterators, etc. Long integers (up to 611 digits). Fast list sorting using user defined comparison predicates. Built-in prettyprinting and formatting facilities. Nearly 300 functions in all.

Flexible. Transparent (yet programmable) handling of undefined function references allows large programs to reside partially on disk at run time. Automatic loading of initialization file. Assembly language interface.

Superbly documented. Each aspect of the interpreter is described in detail. The 300+ page manual includes an exhaustive index. Hundreds of illustrative examples.

Order **Waltz Lisp** now and receive *free* our PROLOG Interpreter
Clog PROLOG is a tiny (but very complete) PROLOG implementation written entirely in **Waltz Lisp.** In addition to the full source code, the package includes a 50 page **Clog** manual.

16-bit versions require DOS 2.x or CP/M-86 and 128K RAM (more recommended). Z-80 version requires CP/M 2.x or 3.x and 48K RAM minimum. **Waltz Lisp** runs on hundreds of different computer models and is available in all disk formats.

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and disconnect, keyboard control built-in auto pulse and tone dialer, differential phase shift keying, local/remote self-test analog and digital loopback test modes. In high speed mode the Avatex 1200 is Bell 212A compatible.

For more information contact:
E+E DataComm, 2115 Ringwood Ave., San Jose CA 95131.

Circle 53 — reader service card.

2400 Baud Fast Modems in 2 Models

Ansco announces better error checking and faster 2400 baud operation in their new Mod 5 and Mod 6 modems. They also operate at 1200 baud, feature automatic baud speed detection, manual or auto answer for unattended operation and manual originate.

Other features include front panel status and diagnostic indicators, operator selected test modes, and connection to the DDD Network that can be "programmable", "fixed loss loop", or "permissive."

The Mod 6 has auto dial and a 20 address telephone number directory. Non-volatile storage of directories and modem configuration settings means you won't have to re-do everything even if you lose power.

Approved by the FCC for direct telephone connection, both modems come with a user/installation manual, 14 feet of cable with RJ-11 "permissive jacks", and a one year warranty. Prices are $795 for the Mod 5 and $895 for the Mod 6.

For more information contact:
Ansco (American National Supply Corporation), 1243 West 134th Street, Gardena CA 90247.

Circle 54 — reader service card.

2400 Baud Companion Modem

CTS DATACOMM products division announces a $795 2400 baud modem, available through CTS DATACOMM distributors. The 2424AD is an auto dial, two wire full duplex modem that meets CCITT V.22 requirements. Synchronous or asynchronous operation is possible at 2400 or 1200 baud (bits per second, or bps). 300 baud asynchronous operation is also supported. Up to 10 phone numbers can be stored, with auto dialing, adaptive dialing, line status detection and RJ-11C and RS-232C interfacing. MITE® communications software is available with the 2424AD unit.

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The CTS 2424AD 2400 baud modem.

Other products available from the manufacturer include 1200 baud CTS 212AH and 212AHC (Hayes compatible), the 4800 baud CTS 4827, the 9600 baud CTS 9629, the 14,400 baud CTS 14.4, and the CTS companionPAC, a portable acoustic coupler. For more information contact: CTS DATACOMM, 6900 Shady Oak Rd., Eden Prairie MN 55344.

Circle 55 — reader service card.

9600 Baud Modem For Networks

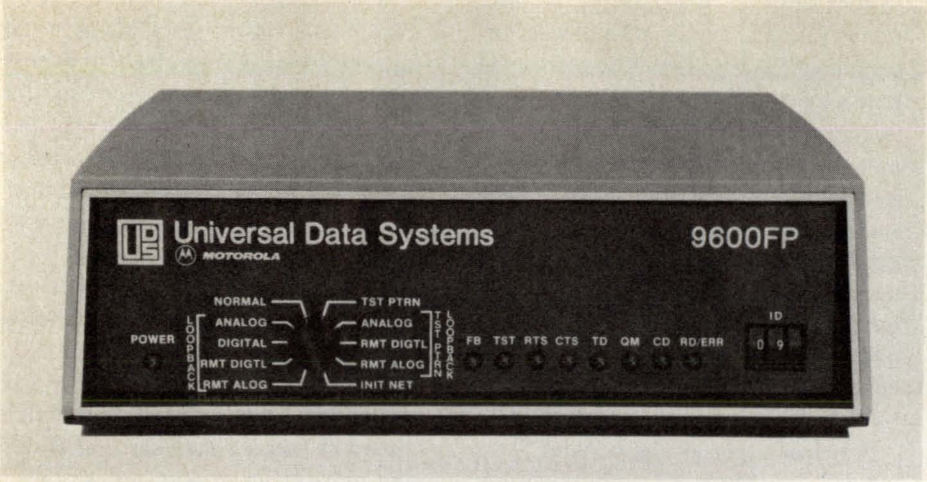
Universal Data Systems, a division of the Motorola Information Systems Group, announces the new model 9600 FP data modem. Designed for use on multipoint networks, it combines LSI and microprocessor technologies which result in high reliability and low power consumption. Fully automatic adaptive line equalization allows 4-wire full duplex private line operation over 3200 unconditioned leased lines without manual strapping. The digital adaptive equalizer compensates for the effects of delay and amplitude distortion that would otherwise cause intersymbol interference in the received signal. The 6900 FP features an 8ms RTS-CTS delay which gives the modem the fastest turnaround time of any multipoint modem on the market, according to the manufacturer.

A 10-position rotary switch on the front panel makes it an easy task for the user to select the talk/data mode, initialization mode, or any of the eight test modes. The nine LEDs on the front panel make it easy for the user to determine the proper sequence for receiving data or transmitting data.

A fallback mode allows the user to change the baud rate to 4800 or 7200. An anti-streaming capability assures that the 9600 FP will not "hang" in the transmit mode and unnecessarily lock up an entire network. The 9600 FP lists for $1995 and comes with diagnostics to minimize downtime.

For more information contact: Universal Data Systems, 500 Bradford Drive, Huntsville AL 35805-1953.

Circle 56 — reader service card.



New 9600 Baud Fast Poll Modem from UDS.

ProModems

Prometheus has announced four new modems — the ProModem 1200 stand-alone includes a clock/calendar for $495. The 1200 combines LSI microprocessors with advanced digital demodulation techniques to produce a modem that offers more for less.

Standard features include Hayes Compatibility, clock/calendar, adaptive dialing, auto redial on busy, help commands, separate voice and data telephone jacks, and 300 baud connect while maintaining 1200 baud RS-232C link.

To upgrade to an electronic mail center requires an additional 2K battery backed up memory, expandable to 64K, and an optional alphanumeric display. The display shows the status of the modem, diagnostic data, phone numbers, incoming messages and real-time clock data.

With the buffer, messages can be sent and received with no computer involvement. Prometheus claims no other modem at this price offers this capability. The Buffer option costs $99 and the display option (which requires the buffer option) costs $99.

For more information contact: Prometheus Products Inc., PO Box 4156, Fremont CA 94539.

Circle 57 — reader service card.

Free Information

Why a Modem

Multi-Tech Systems is offering a free pamphlet which briefly explains the benefits of owning a modem. Designed for the person with no modem experience, the booklet is not just a sales pitch (Multi-Tech manufactures modems), but also describes services you can use when you connect a modem to your computer.

TeleVideo Portable Computer Special
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Purchase the Televideo TPC1, a full-featured portable computer, now and save more than $800.00. The TPC1, comes standard with software that includes CP/M 2.2 as the operating system, (upgradable to CP/M+), plus *TeleWrite* (executive word processor), *TeleCalc* (spreadsheet), *TeleChart* (business graphics), and *Uniform* (a diskette compatibility program). The TPC1 also features a nine inch screen, two double sided double density slimline disk drives providing 737K bytes of storage capacity, 64K of user memory (expandable to 128K), printer ports (centronics and RS232C), modem port, RJ11C SuperMouse port and much more to give you a complete business and word processing system.

Because it is a CP/M based system, there are hundreds of application programs and language compilers available to run on this system. In addition, Trailing Edge has made available *Uniform,* a program that allows you to use the TPC1 with a variety of personal computer formats (including IBM PC and MSDOS) and be free to exchange data and program disks with other computers without compatibility problems.

The TPC1 is sold complete with a 90 day parts and labor warranty and is fully supported by Trailing Edge's Technical Support division. So contact us today to learn more about the power and capabilities of the TPC1, at $795.00, the supply won't last long.

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Multi-Tech Systems produces a complete line of 300, 1200 and 2400 bps (bits per second or baud) modems, acoustic couplers, interface testing devices, statistical multiplexers, communications software and offers data access arrangements. Products are sold through distributors, manufacturers reps., system integrators, value added resellers and retailers. Prices of their products were unavailable at press time.

For more information, and a free pamphlet, contact: Multi-Tech Systems, 82 Second Ave. SE, New Brighton MN 55112.

Circle 58 — reader service card.

Modem Software Needs

A free booklet (20 pages) from Software Synergy explains communications software and outlines the options available. It covers the basics of computer operation, and describes the hardware needed to establish and maintain communication between a microcomputer and mainframes, minicomputers and other PCs. A glossary clarifies the computer language needed to understand both hardware and software. The booklet serves both business and home computer users, and gives information on RESPOND® communications software developed by Software Synergy.

For free copies of the booklet, called "The ABCs of Communications Software", contact: Software Synergy, Inc., 466 Main Street, New Rochelle NY 10801.

Circle 59 — reader service card.

Calling All Vector Graphic Users

The "Vector Owners Newsletter" is available to the respondents of Vector Graphics registration drive to locate end users. "We are receiving hundreds of registration cards every week, and expect to reach over 25,000 Vector users," stated Ron Tharpe, Director of Marketing and Editor of the Newsletter.

The Newsletter contains articles written by Vector Graphic employees on such topics as "Recovering Lost Files," and "CP/M Operating System Software Releases," as well as articles aimed at helping the user find easier and more efficient ways to use their computers.

For a free copy of the newsletter, contact Ron Tharpe, Vector Graphic, Inc., 500 N. Ventu Park Rd., Thousand Oaks CA 91320, or call (805) 499-5831.

Circle 60 — reader service card.

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```
USE TEST INDEX TEST
STORE # TO MFIRST
GOTO BOTTOM
STORE # TO MLAST
```

Later, your program can test whether or not you are positioned at one of these two records. If you are, the program should display an error message instead of executing the `SKIP` (or `SKIP -1`) command:

```
IF # = MLAST
   ? ''End of file''
ELSE
   SKIP
ENDIF
```

Or:

```
IF # = MFIRST
   ? ''Beginning of file''
ELSE
   SKIP -1
ENDIF
```

An unrelated problem which can also result in damaged files is a bug in the GOTO command when used with an indexed file. Let's say you have a record number stored in a memory variable called MRECORD. The command GOTO RECORD MRECORD, which according to the documentation is allowable syntax, will result in duplicate records being added to the data base, with duplicate record numbers. In this case, the solution is simple: use the syntax GOTO MRECORD instead.

Continued from page 4

For value there is nothing better than an under-$600 CP/M computer loaded with public domain (free) software. The commercial packages are usually priced less than their IBM PC counterparts, and there are still more of the specific vertical packages for CP/M systems than for IBM PCs. We'll be reviewing such computers and the public domain as well as commercial packages in this and future issues.

Of course there is also incredible value to be found in the PC-compatible world (notably in "PC clones" and an abundance of "freeware"). We intend to edit *PC User* as we normally edit *User's Guide*, with a focus on MS-DOS and PC-compatible systems, commercial and public domain software, and peripherals.

We also edit *Desktop Publishing* for anyone who produces words and graphics with computers. With these steps we grow from a very small magazine publishing company to a "publishing empire". Step aside, CBS, McGraw-Hill, Gulf + Western!

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The Microsphere RAMdisk For Kaypros

If you use a Kaypro with only floppy disks, you may want to upgrade the system to include a faster, more spacious RAM disk.

by Art Kleiner

A computer with only floppy disk drives just ain't intuitively right.

It's not merely that floppies are slow — human memory is also sometimes slow, and we get used to waiting for it to crank up its engines and retrieve those obscure details. Floppy drives are also too mechanical. For some innate biological reason, no doubt, people expect memory to be a silent, ethereal process — free of whirring motors. Finally, floppy disks are much too limited in size. They don't hold enough.

For instance: on my Kaypro II, shifting disks to hold long documents has been a constant strain. Since I do a lot of telecommunicating, and frequently "port" long documents from one system to another, I have often had to bring in long text files which overflowed the 191K limits of my single-sided disks. When that happens, my terminal program (MITE, which is otherwise an excellent program) rudely ejects me from the network I'm logged into — and I have to log back in and re-start the process of downloading text all over again. After three or four such experiences, I stopped being such a conscientious "porter".[1]

There are only two types of computer memory available now which feel intuitively right — which work quickly, don't make noise, and add large back-rooms of storage to your computer. The premium choice, of course, is a hard disk drive — in which perhaps an extra million bytes of memory could be kept permanently on tap in its own housing. However, like many CP/M machine owners, I don't have more cash to spend on an external memory than I paid for my original machine. Microsphere's RAMdisk is an excellent compromise. I bought mine almost six months ago, and although installing it and learning to use it required me to change some habits, it has made writing and telecommunicating on the Kaypro much, much easier.

Though to non-technical people they often appear to work the same way, a RAMdisk is a very different type of machine than a hard disk drive.[2] A hard disk drive has an actual disk inside it, which is accessed by a magnetic read-write head, the same method used to read floppies. Since it's so large, there's little reason to change a hard disk, and since it's so fragile, you'd be foolish to try; thus hard disks are usually built permanently into their drives.

By contrast, a RAM disk is a solid state board of chips — equivalent to the central processing board of chips inside your computer. There is no magnetic read/write head — the bits flow directly between the RAM disk's circuitry and your computer's circuitry. To expand a RAM disk, you add more chips — assuming that the original chip design can hold them and switch between them. Because it's connected directly, the RAMdisk reacts to signals almost instantaneously; you don't have to wait for the disk to turn to the proper place before your text or data can be stored on it or retrieved from it. Thus, the RAMdisk is much faster to use.

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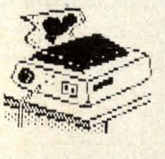

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The Microsphere RAMdisk is also faster than most hard disks because it is connected in parallel, not serial, format to the computer. A serial connection (like the RS-232 jack between your computer and your modem) converts each byte of data to a string of eight bits and transmits them one at a time. A parallel connection transmits all eight bits in a byte of data simultaneously, and thus operates up to eight times faster. (Although rarely will you use your computer fast enough to take advantage of that speed.)

> ***The RAMdisk reacts to signals almost instantaneously; you don't have to wait for the disk to turn to the proper place before your text or data can be stored on it or retrieved from it. Thus, the RAMdisk is much faster to use.***

Hard disks retain one advantage over RAM disks: They're much more voluminous. I could easily store all my writing for a year on a single hard disk. My RAMdisk holds only two-and-a-half times as much — 470K — as a floppy. That forces me to keep my RAMdisk on a constant budget. Most of the time, I keep my programs there, plus whatever text I am working on at the moment. Then, I switch my data files back and forth between the two floppy drives and the RAMdisk drive.

The results of this new machine: a half-dozen blessings. It's much easier to keep track of my data files — because I have two floppy drives between which I can swap data disks between, and I don't have to dedicate one of them to a program disk. Programs kept on the RAMdisk run much faster. Long text files don't overrun the ability of the word processing program to keep up with them, as they do with Perfect Writer, WordStar, *and* NewWord on regular floppies. You can jump from the beginning to the end of a long text file without taking time to go out for coffee in between.

Finally, the Microsphere RAMdisk includes an unequivocal boon; a built-in printer buffer. Printer buffers hold data or text that is on its way to the printer. This frees your computer to go on to another task while your printer screeches away on the first task. Before the RAMdisk, I used to sit idle while I was printing — I couldn't use my computer, and the printer made too much noise to do anything else. Now I turn on the printer, and a minute later the computer is free again.

The RAMdisk is slightly confusing to install, and very confusing to use at first. That confusion can lead to such common horrors as deleting the wrong disk's-worth of files. Using the RAMdisk most effectively means relying on PIP and a sorted-directory program like D, much more than you would need to with floppies.

Hence this tutorial.

Choosing the RAMdisk

The MicroSphere RAMdisk cost varies depending on the size of the disk you get: 256K is $395; 512K is $545; 1 megabyte (1000K) is $995. Even the smallest, the 256K, is about the size of one-and-a-half floppy disk drives on the Kaypro II; but in my opinion, the extra 256K of the medium-size disk more than justifies the extra $150 you spend on it. I'm not so sanguine about the extra $450 you need to jump up to the 1000K model. If you have $1000 available to spend on a RAMdisk, you should probably look as well into the cost of a hard disk (with much more memory space) or a more powerful computer.

The MicroSphere disk works on Kaypro II, 4, 2-84, 4-84, and 2X computers; however, the installation varies depending on what model you have. Before ordering a RAM disk, you should open your Kaypro cover (loosening four Phillips-head screws each on the left and right sides of the Kaypro box, plus two screws on the top) and check a particular chip. On older Kaypros, it's the U52 chip — on newer models, it's the 74LS241. As you face the screen, this chip is in the center rear of the main board — often directly in front of the parallel printer port. (The U52 or 74LS241 label will be printed on the green board next to the chip.) To install the RAMdisk, you will need to replace that chip — MicroSphere encloses the replacement chip in its package. If that chip is soldered into place on your machine, you will need someone experienced in removing soldered chips to do the job for you. Budget that into your time and money. If the chip is not soldered, replacement is relatively easy — even an electronics novice can install the RAMdisk.

Installation

It took me, for instance, less than an hour to complete the installation on my older Kaypro. Unlike the software instructions, MicroSphere's hardware installation instructions are complete and easy to follow. Here's the procedure for older Kaypros.

You open the cover of your Kaypro. You remove the U52 chip and replace it with MicroSphere's chip (making sure that it's placed with the empty top pins on the same side as the notch on the original chip). Removing and inserting a non-soldered chip, for those who have never tried it, is surprisingly easy. Old chips generally pop out smoothly; the new chip must be pressed down steadily until it squeezes itself into its socket.

Next, you screw the two halves of an RCA-type jack together, until it is attached to one of the ventilation holes in the back of the Kaypro. (An RCA jack is cylindrical, about the size of a pencil stub; the RCA plug that fits into it has a long needle-type plug in the center and a stiff metal hollow cylinder plug curled around it.)

Next, you connect two mini-grabber cables — which look like plastic anteater snouts — between the inside connectors of the RCA jack that you just installed and two power connections within the Kaypro. These power connections, found on the right rear corner of the board, are clearly labeled: +5 V 6 and GND 4. Then you close up the Kaypro.

The RAMdisk is a box slightly smaller than a shoebox — a Hayes Smartmodem fits snugly on top of it. The outside is featureless except for two lights (one red and one green), a power switch and a reset button. (You will hardly ever need to use either switch.)

Two cables connect the RAMdisk to your computer (MicroSphere supplies both cables). The first is a power cord, connected between the RAMdisk RCA jack and your computer's new RCA jack. The RAMdisk, unless you set it up otherwise, will be powered by your computer. The second cable is a printer cable, running between your Kaypro's printer port and the RAMdisk. What do you with your existing printer cable? You connect that between the RAMdisk's second printer port and your printer. The RAMdisk lives henceforth between your computer and printer. Once all connections have been made, turn on both computer and RAMdisk, and you can begin installing the software.

Setting Up Your Boot Floppy Disk

Microsphere supplies one disk, which you use with your basic CP/M disk, to create your working RAMdisk *boot disk*; a floppy disk you place in drive A every time you boot up the RAMDISK or turn on your computer.

To create this working disk, start with a blank formatted disk. Put the formatted blank disk in drive B and a copy of your original Kaypro system disk in drive A. At the `A>` prompt, type:

```
MOVCPM 63 * ↵
```

— the screen responds, after a few seconds:

```
READY FOR ''SYSGEN'' OR
''SAVE 32 CPM63.COM''
A>
```

You type:

```
SYSGEN↵
```

The screen responds:

```
SOURCE DRIVE NAME (OR RETURN TO SKIP)
```

You type:

`↵` (a carriage return alone).

The screen responds:

```
DESTINATION DRIVE NAME (OR RETURN TO REBOOT)
```

You type:

```
B↵
```

The screen responds:

```
DESTINATION ON B, THEN TYPE RETURN
```

You type:

```
↵
```

This process probably seems familiar if you've ever used the SYSGEN operation, for copying the basic CP/M configuration from one disk to another. But there's a crucial difference. You have just created a new type of CP/M configuration for your computer — a 63K configuration instead of the normal 64K CP/M on most Kaypro disks.

You must do this, because 64K disks won't work with the RAMdisk; it needs that missing 1K of memory for its own operations. However, I have never noticed or heard of any loss of performance from the missing 1K.

Next, you must finish creating your RAMdisk boot disk (henceforth, I'll call that disk the Boot Disk so we can all remember what it is). Use PIP or COPY to copy all the files from your RAMdisk original disk to your Boot Disk.

Some of the files are also available on your CP/M system disk. Make sure you have them on your Boot Disk (you'll need them):

PIP.COM — you'll use PIP a great deal with the RAMdisk,

SYSGEN.COM — used for converting your other 64K disks to 63K disks, and

COPY.COM — less of a necessity, but still useful.

The other files you should make sure you have copied from your original RAMdisk are:

D.COM — an essential file utility,

DC.COM — used to copy a disk's-worth of files to the RAM disk,

RDISK2.COM — if you have a 256K RAMdisk,

RDISK5.COM and RDISK5B.COM — if you have a 512K RAMdisk,

RDISKM.COM — if you have a 1 megabyte RAMdisk, and

RDISK.MAC and 2DISKST.COM — needed only if you have trouble.

Setting Up Your Other Disks

Since this is now a 63K, and not a 64K system, it is a good idea to change all of the other disks that you will ever put into drive A. For me, that meant changing all my program floppies, plus several of my data floppies.

This is not an essential step, but it makes life convenient later. The Kaypro is designed so that the CP/M that you booted up in the machine must be kin to the CP/M in whatever disk you put in drive A. In fact, you will probably want to redefine your RAMdisk as drive A (see the section later called DRIVE E OR DRIVE A?). However, especially while you are getting used to the RAMdisk, you can avoid a lot of irritating error messages by setting up your most commonly used floppies as 63K disks.

To do so, put your new Boot Disk in drive A, and one of your other disks in drive B. Type:

```
SYSGEN↵
```

You will be asked for a source drive — which should be A — and a destination drive — which should be B. When the SYSGEN is complete, you will be invited to substitute a new disk in drive B and start the process over again. Continue until all the disks are converted. Henceforth, you will be able to tell whether a disk is 63K or 64K. When you first turn on your computer, or hit the reset button, you will see a message on your screen somewhat like this one on my screen:

```
Kaypro II 63K CP/M vers. 2.2
```

(Naturally, the message will vary, depending on what model Kaypro and version of CP/M you have running.)

All this thus far is preparatory, and hopefully you'll never have to do it more than once. The rest of this tutorial covers work you'll have to do repeatedly.

Setting Up The RAMdisk

This is the procedure every time you start your RAMdisk from a *cold boot*; either by turning your computer on, or pressing the reset button on either computer or RAMdisk.

Bring your computer up from cold boot with the Boot Disk in drive A. At the `A>` prompt, if you have a 256K RAMdisk, type:

```
RDISK2↵
```

or, if you have a 1 megabyte RAMdisk, type:

```
RDISKM↵
```

Ah, but what if you have a 512K RAMdisk? You have a choice of a 32K or 64K print buffer. To get a 32K print buffer, type:

```
RDISK5↵
```

or, to get a 64K print buffer, type:

```
RDISK5B↵
```

A 32K print buffer holds a WordStar file of perhaps 10 pages. The larger print buffer frees up your computer all the more quickly when you print long documents, but it leaves you less space for files on the rest of the RAMdisk. Experiment with both; I usually install the 32K buffer.

Your screen will prompt you something like this:

```
Microsphere Ramdisk Driver v. 5.1
(c) 1984 Microsphere Inc.
Format Ram Disk (y or n)?
```

You type `N` if you have text or programs on the RAM disk already that you want to save. Type `Y` if the RAMdisk is empty or new, or if you want to erase anything already on it.

If you type `Y`, you will be prompted:

```
Confirm (y or n)
```

Type `N` if you made a mistake. You will be brought back to the `A>` prompt, from which you must reset the computer and start over at the beginning of this section.

Type `Y` to confirm that you are reformatting the RAMdisk. As the RAMdisk is reformatted, your screen will fill with dots.

Whether you formatted the RAMdisk or not, when the process is completed, the screen will prompt you:

```
Copying CP/M to RAM Disk
Ram Disk => E
Warm Boot
A>
```

Henceforth, whenever you warm boot (with a Control-`C` or by returning to CP/M from another program), the computer will tell you what drive the RAMdisk is attached to.

Your choices are drive E (where it starts) or drive A. See the next section to learn how to choose.

After that, your RAMdisk is completely installed. Copy a program like WordStar or Perfect Writer to the RAMdisk, copy a data file there, open a data file with the word processing program, and see how much faster it runs.

Drive E or Drive A?

To switch the RAMdisk from drive E to drive A, or from drive A to drive E, type:

```
DIR F:↵
```

This incomprehensibly named command (why DIR F:?) is one of the most-used RAMdisk commands.

The advantage of keeping your RAMdisk as drive E — it's already drive E — one less change to cope with; slightly less confusing at first.

The advantage of changing it to drive A: it works better, both technically and in terms of human habits.

The most effective way to use your RAMdisk is to keep your programs there. That way, you don't have to swap floppies to run new programs and the programs run much faster. It becomes easier to keep your programs in the RAMdisk and label it drive A.

Some programs, like NewWord, will not work with the RAMdisk unless it is set as drive A. Otherwise, they will write files to the disk incorrectly, and jumble up parts of files. Other programs, like WordStar, can't work without supplementary overlay files; and they look for those files on Drive A. You must redefine the RAMdisk to drive A to use WordStar effectively.

> ***Printer buffers hold data or text that is on its way to the printer. This frees your computer to go on to another task while your printer screeches away on the first task.***

Finally, renaming your RAMdisk to drive A pushes home the emotional point that you are no longer working on a computer with two floppy disk drives as your working storage. You are working with a computer that has, say, 470K of working storage immediately accessible. 90% of the time, you work in that area. After all, you bought the RAM disk to get away from the grinding of disk drives, didn't you? That's why drive A should be the RAMdisk. The floppy drives are now back-up storage.

What happens to your old drive A? It becomes drive E. Drive B remains drive B.

It *is* confusing at first. I found I had to make up large bold labels: A for the RAMdisk, an E for where drive A used to be, and a B for drive B. (Otherwise, I kept confusing A and B with drive E, a situation that surprised me.)

If you don't keep track of which drive is which, you'll lose files. Plain and simple.

Whether you call it drive A or E, your RAMdisk emulates a floppy drive. Type `A:` or `E:` to go there. The prompt you get looks just like a CP/M prompt. CP/M commands — REN, DIR, etc. — run just as they would on a floppy drive.

The Power Problem

The RAMdisk gets its electrical power from the little grey cord from your computer. That means that every time you shut your computer off, all data on your RAM disk will be erased, and you will have to reformat the disk every time you turn on your computer. There are three possible approaches:

1. Keep backup copies of every file on your RAMdisk (you should do this anyway; what if someone accidentally trips a circuit breaker and you lose your data?). Then, recopy your working files onto the RAMdisk whenever you turn the computer on.
2. Never shut your computer off. This is actually a viable solution, since it does not harm the computer (some people say it's better to leave the computer constantly on). I opt for this course. However, if you or your office-mates are sensitive to the high-pitched noise made by the flyback transformer on many computers (in many cases, men seem to hear this noise much less strongly than women), you'll probably have to seek another option.
3. This alternative lets you power down the computer, but leave the RAMdisk powered on. Buy a separate 5 volt DC power source and connect it to an RCA jack; then use that to power your RAMdisk separately from the computer. Thereafter, whenever you turn your computer on, the RAMdisk will be waiting with all the files intact (unless you've had a power blackout).

Manipulating Files

Since I never turn the computer off now, my floppies are my backup storage areas. I make a backup every time I step away from the keyboard. RAMdisks can be fragile. What if the power goes out, even for a moment? Everything on the RAMdisk will be lost.

Generally, I keep a floppy dedicated to the topic I'm working on in drive B or E. Each time I save a file, I copy the file to that floppy. Sometimes I use the copy command built into NewWord or WordStar; however, that command will not allow you to write over an existing file. To avoid the unnecessary proliferation of drafts, I exit the program and type:

```
PIP B:=A:MYFILE.NEW↵
```

A plausible shortcut approach (one I'll get to Any Day Now) is to use a key defining program like SMARTKEY or XTRAKEY, and define a key that takes you out of your word processing program, copies the file, asks you to name the file you're copying it to, and brings you back into the word processor.

If I forget which is the newer draft, I use D.COM, which gives me an alphabetical directory of file lengths with the amount of space they take up, looking something like this:

```
A>D↵
MYFILE   TXT 6K  :  NW      OVR 32K  :  NWPRINT OVR 30K
NW      COM 12K  :  NWMSGS  OVR 52K  :  OURFILE TXT 21K

A: 470K      Used: 6/173K     Not used:   56/297K
```

On the 512K RAMdisk, configured with a smaller printer buffer, I have 470K available total, with 62 possible directory entries. (The other 42K, by the way, is used for the RAMdisk's self-management and the printer buffer.) In this example, I've used six of those directory entries, for a total of 173K.

If you have dozens of small files, you may run out of available directory entries. The best solution for that is the CP/M user areas system. (Out of the range of this tutorial.) I have never needed user areas, myself.

Compatibility and Crashes

I have used the RAMdisk with a variety of programs: NewWord, WordStar, Perfect Writer, Perfect Filer, MITE, Smartkey, Filebase, Lync, Hypertyper, and a dozen or more utilities. I have never had a compatibility problem concerning the RAMdisk itself (except that some programs want the RAMdisk to be drive A:).

On the other hand, I have had compatibility problems between the programs themselves. Most of these programs would have stayed safely on separate disks if I didn't have the RAMdisk. NewWord, for instance, does not work after you have loaded a public domain screen dump program (DUMP-63K) that Microsphere throws in for free on the RAMdisk disk. In another case, NewWord couldn't function because I had inadvertently entered a file without a name in the directory.

When any of these things happen, the program may freeze. In fact, just while writing this article, my word processing program froze three times. (This article was a special case; I regularly had to leave the word processing program and go check out some feature of the RAMdisk itself; normally I go for weeks without the RAMdisk freezing up.)

On a floppy, when a program freezes, you push the reset button and hope you didn't lose your data. On the RAMdisk, you have to hope you didn't lose your data *or* your programs. Here are the steps for recovery.

Recovering From a Freeze-up:

Press the reset button on your computer (*not* on the RAMdisk itself!).

Put the RAMdisk Boot Disk in drive A. At the `A>` prompt, type:

```
RDISK5 ↵
```

— or the equivalent if you use a different RAMdisk size.

When it asks if you want to Format the RAMdisk, type `N`. It will write CP/M to the RAMdisk. Then type:

```
DIR F: ↵
```

to change the RAMdisk to drive A. At the `A>` prompt, type `D` to make sure your files are intact. *COPY ANY IMPORTANT FILES TO A FLOPPY FIRST!* Then see if you can figure out why your computer froze up.

Incidentally, I keep all my commonly-used program files on one disk, configured for the RAMdisk. When the RAMdisk freezes up (or I want to temporarily clear some space off of it for a special project), I have the files on my floppy, ready to port over to the RAMdisk with this simple command:

```
PIP A:=B:*.* ↵
```

Another incidental comment: I have not used the RAMdisk with either PLU*PERFECT or ZCPR, but I have spoken at length to people who have. They report no problems, though in each case there are special installation instructions (included with the RAMdisk) which you must follow to make it work.

Conclusion

I often get asked why I don't trade in my Kaypro II for an MS-DOS computer. To tell the truth, if I could easily afford to, I probably would. But I would miss the RAMdisk. It has turned my Kaypro from an adversary — a machine I am always trying to tax beyond its limits — to a friend.

Footnotes:

1. Before you *User's Guide* as a hopelessly elitist publication, I hasten to add that floppy drives *are* the best storage value — they offer an infinite amount of disk space (as long as you don't need too much at any one particular time) for a pretty cheap price. That's why they're standard instead of hard disks or RAMdisks. And if I did not have any other choices, I could manage acceptably with them — though I'd evolve over time towards shorter and shorter files. For the long haul, if you use your computer very much, a system with only floppies will become a daily, er, grind.

2. There will someday be a third choice for storage — the *Compact Disk (CD)* now sold as an alternative to long-playing records. Industry flacks say that writeable CDs will be available during the next few years. However, no one is sure how much CDs will cost, it's not certain if there will be CP/M software to support them, and if you're like me, you have storage needs now.

3. Note: some older Kaypro IIs have two chips labelled 74LS243 instead of one U52 chip. In this case, Microsphere will send you a different chip assembly; make sure you notify them when you buy the RAMdisk.

Disk Cataloguing

Getting a Unix fix from the Carousel MicroTools Toolkit.

by David L. Hawkins

The Toolkits are published by Carousel MicroTools, Inc., 609 Kearney Street, El Cerrito, CA 94530, (415) 528-1300. Prices are: Use-a-ToolKit—$249, Build-a-ToolKit—$349, Manual—$39.

The Toolkits are available for both CP/M and MSDOS.

Four of the people at Carousel wrote an article in the November 1983 *BYTE*. It has a more descriptive approach to the tools.

What's the difference between Unix pipe and Unix hype? Why do people want a Unix system? What will it do on a micro? What good is a software toolkit? Is it worth the trouble to learn how to use software tools? Finally, what's this article have to do with Unix anyway?

To answer the last question first, Unix is a system for minicomputers that many programmers love to use; hence, many programming tools that have migrated to microcomputers tend to resemble Unix tools. Carousel provides such a package of tools for CP/M computers. Unix itself cannot run on the type of computer that CP/M was designed for, but you can create a Unix-like environment on CP/M with additional software such as Carousel's Toolkit.

I received the December 1984 *User's Guide* (double issue #11/12) right after I had a chance to look at a review copy of the Carousel MicroTools. Reading the article comparing Eureka! and Catalog sparked my interest in using the Carousel Toolkit to do the same task. The Toolkit is a system based on Kernigan and Plauger's *Software Tools.* The tools are similar to the UNIX operating system.

The Carousel Toolkit contains over sixty programs, called *tools* — each written for a simple, clear function. These can be combined in a wide variety of ways to achieve an incredible number of tasks. They are similar to CLIP (reviewed in the December '84 issue #11/12), but are closer to the traditional Unix setup. The principles of input/output re-direction, shells, and pipes are common to both.

On my third day with the Toolkit I decided to try using the tools to write a disk cataloguing program. Since my wife and I both write papers we fill up a lot of disks — we have 55 now and we have only had the computer three months. It's about time to start cataloguing! Fortunately it took only thirty minutes to write and test the program script in this article. That gives you some idea of how easy it is to use the Toolkit to accomplish a task.

Programming Guidelines

My program reflects my specific needs at this time. I wanted to be able to name the disk at the time I catalogued it. I did not want to use CP/M's SAVE command to name the archive or catalog disk beforehand, as done with some cataloguing programs.

For each disk I wanted to be able to decide which files to ignore or include. On my games disk I need only a list of the ".BAS" (BASIC) games. On the disk where I debug assembly language programs I need only to list either the ".HEX", ".COM", ".ASM", or ".PRN" files, but not all four. On some disks I want to exclude a specific file extension. I've included an option for editing the catalogue. The listing searches all sixteen user areas, but normally I would search only two. The Toolkit can easily write and copy files to different user areas without the limitations of CP/M.

The heart of my program is one line:

```
ls /0/b/ -vp >> /0/a/direct.ory
```

The `ls.tol` is the Toolkit directory program. It is built into the "shell" supplied with the Toolkit.

The `/0/b/` is the Toolkit convention for designating the B drive, user area 0. The flags `-vp` tell the directory to list the full name as found in the disk directory, i.e., `/0/b/ws.com`.

The double right arrows (`>>`) redirect the output of the `ls.tol` directory program. Rather than displaying the filenames on the screen, as CP/M's DIR always does, the display text is appended to the file `/0/a/direct.ory`. The file is created if it does not already exist.

The above line makes a catalog only for user area 0 and does not add notes about the files. Next we'll add the "bells and whistles" to it. Rather than writing a program using a computer language, I wrote a "script," or long "submit" file to turn over to the shell for processing. The script calls on specific tools to perform specialized tasks while the shell supervises the operation.

Using the "e.tol" editor allows flexibility in deleting items that don't need to be catalogued.

```
# This script written by David Hawkins 12/4/84.
#
echo This program makes a file  directory of the disk in drive b
#
# The inputs are the disk name (-2484),  a or x to include/exclude
# an extension, the extension (.ext),  and a comment in quotes
# These are represented by $1 - $4 in the script
#
# The next line inserts the input  comment into the directory
echo  $4 > /0/a/$1
#
reset Insert disk into drive b for directory
# the next line dates the new directory
date >> /0/a/$1
echo  Checking directory of user area  0
ls  /0/b/ -vp$2 $3 >> /0/a/$1
echo  Checking directory of user area  1
ls  /1/b/ -vp$2 $3 >> /0/a/$1
echo  Checking directory of user area  2
ls  /2/b/ -vp$2 $3 >> /0/a/$1
# This script checks user areas 0 through 2
# although it could check all 16
#
# e edits the new directory so you can add comments
e /0/a/$1
#
echo Now adding directory to archive  and copying to disk b
cp /0/a/$1 /0/b/$1
# adding new directory to archive  file or updating existing directory
# entry in the archive.
ar -u archive /0/a/$1
# removing temporary file
rm /0/a/$1
#
echo The directory is finished.  To make another directory type
echo MAKEDIR (name) (x or a)  (.ext) ("comment")
```

Figure 1. *The first version of the cataloguing program script can take up to nine arguments for processing.*

The Program

The script can be written using any word processing program, or by using the toolkit's e.tol, a line oriented text editor. Like any UNIX-type editor, it is not designed to be user-friendly. However, it is powerful enough to be worth mastering. I wrote the script using e.tol, but could have worked faster in WordStar's non-document mode. However, using e.tol had the advantage of taking up less disk space, which was an advantage while writing and debugging the script. Using e.tol also meant that I didn't have to leave the shell to work on the script.

The script can take up to nine arguments for processing. I decided to only use four; one for the disk name, one including/excluding certain extensions, one for the particular extension to be included/excluded, and one for a comment to be included in the new directory. These are represented in the script as `$1` through `$4`. The arguments are similar to CP/M's SUBMIT utility, but can include more than just filenames.

The echo.tol is used two ways here: first, to place the comment in the new file; and second, echo reports the process of the script at work. The first working line, `echo $4 > /a/$1`, places the comment line in a new file which has the disk name. The next tool, date.tol, appends the date. Since my Kaypro does not have a built in clock I have to set the date when I start. I could use another argument to pass the script the exact time and date.

The reset.tol resets the disk directory as a `^C` would to CP/M. This is done without losing the place in the script. In this case it includes a prompt to tell the user to insert the disk into drive B. The `echo.tol` informs the operator of the progress of the script. If the script is checking all sixteen user areas

```
# This script written by David Hawkins 12/7/84.
#
# This program makes a file directory  of the disk in drive A
#
# The inputs are the disk name (-2484),  choose/ignore files,
# extensions to choose/ignore, and comment
#
# The next line inserts the input comment  into the directory
echo  $4 > /0/b/$1
#
reset Insert disk into drive a for directory
# the next line dates the new directory
date >> /0/b/$1
#
echo  Checking directory of user area  0
ls  /0/a/ -vp$2 $3 >> /0/b/$1
echo  Checking directory of user area  1
ls  /1/a/ -vp$2 $3 >> /0/b/$1
# using WordStar to edit the new directory  so you can add comments
reset Insert editing disk into drive a
a:ws b:$1
reset Insert archive disk into drive a
#
echo Now adding directory to archive  and copying to disk a
cp /0/b/$1 /0/a/$1
# adding new directory to archive  file or updating existing directory
# entry in the archive.
ar -u /b/archive /0/b/$1
# removing temporary file
rm /0/b/$1
echo The directory is finished.  To make another directory type
echo MAKEDIR (name) (x or a) (.ext) ("comment")
```

Figure 2. *The final version of the cataloguing program includes the step of having the script turn control of the process over to e.tol, the text editor. The editor can then be used to add comments.*

on a disk that has a large number of directory entries, the operator might start wondering if something went wrong. I included this feature to aid in my debugging.

In my final version I included the step of having the script turn control of the process over to e.tol, the text editor. The editor can then be used to add comments. The editor also uses buffers and can read in a file from the disk being catalogued if there is doubt about what it contained. Using the editor allows flexibility in deleting items that don't need to be catalogued, like old SUBMIT scratch files or files of misspelled words. Using e.tol requires the operator to know how to use the editor.

The script could turn control over to your favorite text editor, i.e., WordStar, with a line like this:

```
/0/a/ws b:$1
```

This would allow you to edit with commands you are familiar with. The script would automatically resume when you exited to CP/M by using a ".SUB" file (used with SUBMIT). This would work best if the cataloguing disk was in drive B. The reset tool would allow you to remove the archive disk and insert the word processing disk.

There are tools that will read in the first, last, or marked lines from all the files, but my files were not prepared to allow me to take advantage of those features. If you place a comment line at the start of each file, the pl.tol or find.tol will find it and can include it in the new directory.

Next I used ar.tol, the Carousel archiver. It can include all the text files of your disk in one large file of text. It is possible to archive the archive — have all the files from a disk placed in a larger file and then keep a separate file of lists of file directories

There is also a tool called cpress.tol that compress files. It makes the larger file take up less disk space. Since the archiver makes one large file there is no problem with the cataloguer running out of space in the directory of the disk.

The edited directory can then be copied to the archive disk with cp.tol. For my 391 K disks an edited directory takes up four K. The directory will be written to the name given without having to use the SAVE command. It will include the date and any comment that was entered as an argument.

Overview of the Toolkit

I've used eight of the sixty tools in the Carousel Toolkit. There are other tools that could have put the directory listing in a multi-column format, added printing guidelines, and printed the listing — all automatically. Some tools could have read in lines from the files, either the first, last, or comments. There are tools that could sort the list, or add a word, line, or character count for each file.

Advantages

First, the script does what I want it to. I can leave out the editing step, or drop how many user areas I want searched. Each step can be altered easily. I could use the simple form and just have the script put a directory listing on each disk. If I want to forgo the use of the arguments I can have the script call itself to repeat the cataloguing. I would then use the e.tol as part of the script to enter the file name and other information.

I can name the disks as I'm working — I don't have to use CP/M's SAVE command before starting, to create a file on each disk for naming the disk. This script is "portable" in the sense that I could use these same commands and get the same results on a different machine that used the same kind of tools. If I had spent the time to write an assembly language program I couldn't have used it on another Kaypro if it didn't have a version of CP/M that provided user areas.

> ***The Carousel Toolkit contains over sixty tools, each written for a simple, clear function, that can be combined in a wide variety of ways to achieve an incredible number of tasks.***

Another advantage to writing this script is that I've learned the concepts of the UNIX system. The Carousel Toolkit is well written and very well packaged. Mastering a UNIX-type system might be a better use of your time than mastering CP/M.

Disadvantages

If the operator is going to use an editor to add comments to the files, it would be better to not use e.tol. This tool is not easy to learn. Someone who is familiar with Unix might not have a problem learning it, but it would be quicker to use an old standby. It was a challenge, so I enjoyed it, but not everyone is into such challenges.

Speed is a problem. Some of the tools, like echo and ls, are built into the shell, but the others have to loaded when they are to be used. This can be time consuming. Checking fewer user areas saves a lot of time.

```
   12/05/84 00:00:00
/0/b/address.lst      19         R/W
   list of phone numbers and addresses of friends and relatives
/0/b/biblio.doc       16         R/W
   bibliography on the paper on feminist theology
/0/b/david.csd        50         R/W
   checking account for CalcStar
/0/b/directry         9          R/W
   old directory of this disk before I named the directory.
/0/b/e1.doc           10         R/W
   ethics paper for Fall 1984 semester
/0/b/ethics.doc       22         R/W
   paper typed for another student
/0/b/feminist.doc     93         R/W
   20th century theology paper on feminist theology - Perfect Writer.
/0/b/hunger.doc       18         R/W
   paper on world hunger fall 1984
/0/b/hunger1.doc      11         R/W
   letter to Congresswoman Boxer about world hunger
/0/b/hunger2.doc      12         R/W
   letter to Senator Wilson about world hunger.
/0/b/ideas.doc        10         R/W
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/0/b/mental.doc       16         R/W
   article about mental health programs in San Francisco
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   letter to mom Oct 1984
/0/b/pc.doc           89         R/W
   paper for pastoral care class 1984
/0/b/reminder.doc 7  R/W
   reminder list of things to do this semester fall 1984
/0/b/sessions.doc 6  R/W
   notes on recorded counseling sessions
/0/b/sits.doc         17         R/W
   list of situations for ethics discussion fall 1984
/0/b/submit.mss       9          R/W
   cover letter for submitting an article.
/0/b/survive.doc      15         R/W
   how to survive the loss of a love (written while I was single)
/0/b/winners.doc      18         R/W
   article on starting mental health program
/0/b/winstall.doc     94         R/W
   article on how to customize WordStar
/0/b/wordstar.doc     10         R/W
   article on WordStar tricks
```

Figure 3. *The Carousel archiver can include all the text files of your disk in one large file of text.*

Cost is another consideration. Don't buy a software Toolkit just to use this script. Buy it with the intent to learn the system and write scripts and programs that will meet your needs. It can make the programming life much easier.

In comparison with Eureka! and Catalog this script is not user friendly.

```
% makedir  dback  x    .com "Backup disk"
This program makes a file directory of the disk in drive b
Insert disk into drive b for directory
'return' when ready ↵
Checking directory of user area 0
Checking directory of user area 1
Checking directory of user area 2
23        (This is how many lines e.tol read)
:         (This is the e.tol prompt)
 .
 .
 .
(Editing)
 .
 .
 .
: w↵      (This tells e.tol to write the file)
44        (This is how many lines were wrote)
: q↵      (Quitting e.tol)
Now adding directory to archive and copying to disk b
The directory is finished. To make another directory type
MAKEDIR  (name)  (x or a)  (.ext)  ("comment")
%
```

Figure 4. *A sample run of the script MAKEDIR; the percent symbol is the shell prompt, and the colon is the e.tol prompt.*

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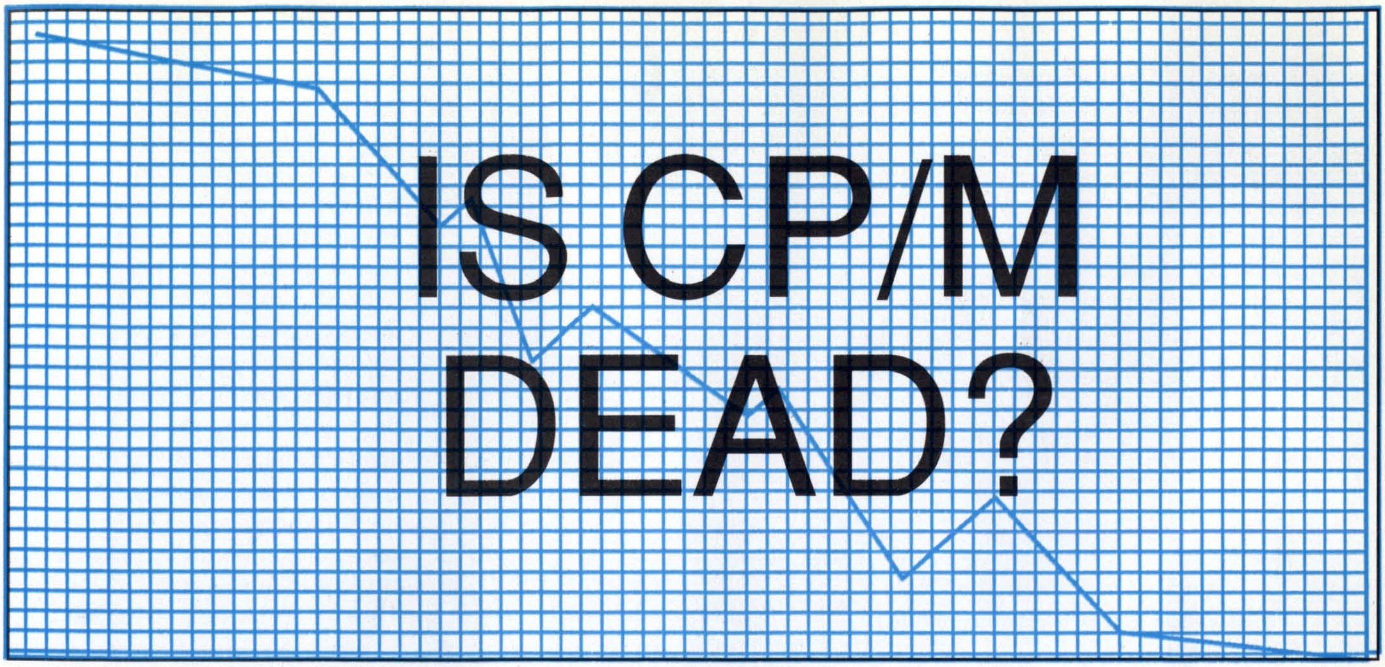
Since I wrote it I find it easy to use and adjust. But there are no help menus or manuals for running the script. It helps to comment the script so it can be read before being run, but any error messages aren't going to be easy to understand. Unix was written to be easy to type, so it tends to have terse commands and few error messages. A beginning programmer can easily feel totally baffled when something goes wrong. At least the scripts don't crash easily. While debugging I got several error messages but the script ran perfectly. The error messages were a hint to be more careful in my programming style.

Conclusion

The Carousel Toolkit is a good programming tool if you want the power of the tools without having to write each one beforehand. The manual is very well put together. They include some humor and provide some hope for e.tol since they use it to write the manual. After using scripts to handle different tasks you can write and test your own tools to work with the existing ones.

The Toolkit is based on RATFOR, rational Fortran, a C-like language. More tools can be developed by buying the MicroSoft Fortran-80 compiler and Linker-80 if you have a CP/M-80 machine. Those using MS-DOS 2.0 need the IBM Fortran and Linker in order to write more complex programs than this script.

The toolkit would be a valuable asset to someone working with both CP/M and MS-DOS. By using a toolkit for each you could take programs and scripts from one system to use on the other. It would be possible to work in the shell on both and use just one set of commands. You can leave the shell to run other programs and the shell will return via a SUBMIT file when you exit the nonshell program. Using a UNIX-type of system makes it easier to live with a rapidly changing computer world.



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Why You Should Avoid Layers (Unless They're Hens)

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THE SLEAZE PATROL

It's amazing how much personal power flows from being a megalomaniac. Unfortunately, people without the courage of their own grandiosity tend to misunderstand this phenomenon, assuming that megalomania merely makes you *think* you have enormous power — as if that belief were a *delusion*!

Delusion, indeed! No, my friends, thinking you have enormous power *actually gives you enormous power*. This column itself is proof of that. When I began writing it, the world was full of deceit and fraud. Yet now, barely one year later, these evils have apparently been eliminated — at least as far as the readers of this magazine are concerned.

How do I know that? Well, in my last column, I made the following appeal:

Give me your ired, your skewered,
Your befuddled masses yearning to be sleaze-free,
The ripped-off refuse of your scheming stores.
Send these, the hopeless, money lost, to me:
I thrust my lance and even up the scores.

(I worked too hard on that to use it only once.)

But despite this and other pleas in earlier columns, I've received very few complaints; in fact, only two seem to have any real substance. As it happens, both come from foreign shores.

Sleaze from near and far

The first shore is on the Tasman Sea, where sits Narrabeen, Australia (it's right near Mount Ku-ring-gai, for those of you not up on your Sydney suburbs). Narrabeenite (Narrabeener? Narrabeenian?) P. E. Cogar wrote to complain about *Piconet* magazine, which is published in Mountain View, California (at least that's their mailing address; no phone number is listed under their name there).

The other foreign shore is that of Great Slave Lake, site of Yellowknife, capital of Canada's Northwest Territories (more importantly, it's also the birthplace of Margot Kidder). Ter Hamer of that town wrote to complain about "Budget Computer Softwares [sic] Club" of Quogue, New York. (Yes, these places really exist; Quogue — pronounced KWAHG — is on the south shore of Long Island about 75 miles east of New York City.)

Both these cases are currently under investigation by the Sleaze Patrol's crack teams of consumer advocate/commandos. (By the way, if you send in a complaint to the Sleaze Patrol, please enclose the phone number of the company you're complaining about, as well as their address, if you have it. And, if possible, please use caps and lowercase letters; all caps is very hard to read.)

There are two possible reasons for such a meager harvest of complaints:

- I have no readers
- I have completely eliminated fraudulent dealings from the microcomputer industry.

Naturally, I lean toward the latter explanation. Perhaps, as the Lone Ranger used to say at the end of each adventure, "my work here is done." Does this mean I should ride off into the sunset with my faithful Indian companion, Tante (she's Tonto's aunt), leaving the awestruck hayseeds (don't take this personally; I'm just painting a picture) scratching their heads and asking each other, "Who was that masked man?"

No way, Jose. Tony and Cheryl

were foolish enough to give me this column and I'm going to cling to it till they pry it away from me with a hydraulic jack. To substitute for the dearth of specific complaints, I'll turn to general principles. In this issue, I'll discuss the first of these:

Naiman's Law

Naiman's Law is really nothing more than a corollary of the two great principles on which the modern study of bureaucracies (governmental or not) is based; I refer, of course, to Parkinson's Law and the Peter Principle.

Parkinson's Law, put forth in 1957 by C. Northcote Parkinson, states that "work expands so as to fill the time available for its completion." It follows that "there need be little or no relationship between the work to be done and the size of the staff to which it may be assigned." Parkinson goes on to state that since "an official wants to multiply subordinates, not rivals... administrators are more or less bound to multiply," quite independently of any need for them.

The Peter Principle, propounded in 1969 by Lawrence J. Peter, argues that since doing your job well usually gets you promoted, and doing it poorly usually doesn't, people tend to be promoted till they reach their "level of incompetence." There they stay, until some primordial force dislodges them. As a result, any organization that's been around for a while is likely to be composed mostly of people who are no good at what they're doing.

Naiman's Law merely draws an obvious conclusion from these two principles: *The more layers you have to go through to get something done, the less chance there is it will get done right.* The practical implication is clear: whenever possible, patronize companies with the fewest layers.

Let's see how Naiman's Law works in nitty-gritty specifics of everyday life. Once again, I will dip into my vast store of personal distress to provide an example.

The Case of the Frail Imagewriter

I love my Macintosh — far more than any other computer I've ever used. But it hasn't proved to be the most reliable piece of equipment in the world. Fortunately, you can buy a service contract for it, called AppleCare, and you can renew it for as long as you own the system. Owning a Mac without AppleCare isn't unwise — it's psychotic.

But AppleCare won't do you any good unless you can find a good local computer store to do the actual service. I'm lucky, because there's one near me that has both knowledgeable, sophisticated sales people and a skilled, caring repair staff. There's only one problem with this store — it's a Computerland franchise, and that adds several layers on top of these good people.

Usually these extra layers don't get in the way, but in the case of my Imagewriter printer, events propelled me into the bureaucratic maze at Computerland's corporate headquarters, with predictably disastrous results.

I give my Imagewriter a *lot* of use, and that's probably why it began making funny noises in the summer of 1984. I brought it in to the store in early September, but they couldn't figure out what was wrong. The noises continued, and I was worried that the machine would break down in the middle of printing out a book I was working on. So I brought it back later in the month, and they realized then that something called the carrier motor was on its way out.

The repair department has a spare parts kit, but Computerland Corporate had omitted carrier motors from it (apparently in an economy move). So my local store had to order one directly from Computerland's centralized purchasing department (they weren't allowed to order one directly).

I kept calling the store, but the part never arrived. The weeks dragged on and became months. Finally, in late November, more than $2^1/_2$ months after I'd first reported the problem, my Imagewriter bit the dust. The carrier motor still hadn't come in. It was unclear when — or even if — it had been ordered by Computerland Corporate.

If the only decent store near you is a Computerland, be very very good and say your prayers every night and hope that you never sail past the store level and fall into dodoland.

A flurry of phone calls erupted between me, the store and various bureaucrats at Computerland Corporate (who so exemplify the Peter Principle that you could explain it to someone simply by pointing at one of them).

The upshot of all these calls was not encouraging: There were no carrier motors *nor* any Imagewriters to cannibalize one from *nor* any other Imagewriters, new or used, to lend me until mine was fixed — either at my local store or at any other Computerland store in the Bay Area or at corporate headquarters' central purchasing department. How's that for being prepared? These people had obviously never been Boy Scouts.

So I went and rented an Imagewriter at a different computer store. A couple of weeks later, the part finally arrived at my local Computerland (my awesome telephonic onslaught had apparently shaken something loose down at headquarters) and they fixed my printer.

Whiplash need not apply

After it was all over, I decided that I had no hope of being compensated for all the hassle I went through, the time I'd spent on the phone and driving to the other computer store, the mental and emotional anguish, the whiplash — no, wait, that doesn't apply here. But I'd be damned if I was going to lose the $71.40 I had to lay out to rent the other Imagewriter. (It's kind of warm here in hell, but the devil really isn't such a bad guy.)

So I wrote Computerland Corporate a letter and asked them to foot the bill. Now you'd think they'd do it out of common decency, especially when the amount was so small — "a matter of principle," as it's called by cheapskates like me. Or, at the very least, you'd think they'd do it out of common sense — that rarest of all qualities. I'm sure that if it had been the decision of any of the sales or repair people in the local store, they would have simply paid the money and been done with it. Ah, but that's only because they hadn't risen to their level of incompetence.

Computerland Corporate wrote me back to say that they felt "no responsibility" for "the delay" (a delicate and understated way to refer to a three-month wait, I thought). They had spoken to the store owner, and she agreed.

Actually, in view of current developments, I suppose they did the right thing. Now that Computerland has to post a $237 million bond to appeal a judge's decision that they breached a contract with investors, every nickel counts.

So, what's the moral — never deal with a Computerland store? No, not if it happens to be the best store around. I still use the Computerland I've been talking about, because the people on the lower levels (up to and including the store manager) are terrific.

But if there are two stores, equally convenient to you and equally staffed with good people, you'd be wise to choose the one that doesn't have to stagger under the load of a centralized bureaucracy. And if the only decent store near you is a Computerland, be very very good and say your prayers every night and hope that you never sail past the store level and fall into dodoland.

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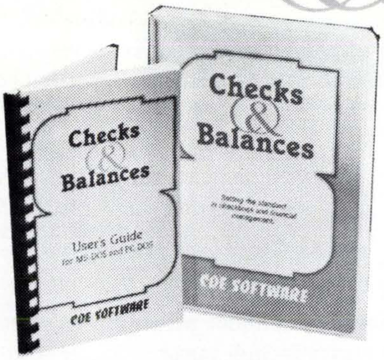

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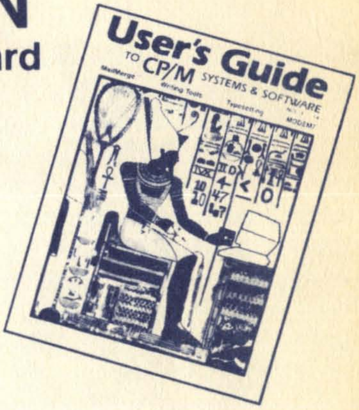

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A. Your computer experience?
1.☐ Novice
2.☐ Semi-intermediate
3.☐ Intermediate-advanced
4.☐ Advanced

B. Occupation?
1.☐ Executive/manager
2.☐ Small bus. owner
3.☐ Professional
4. ☐ Other

C. Use which computer(s)?
a. ☐ Apple
b. ☐ IBM PC
c. ☐ CompuPro
d. ☐ DEC
e. ☐ Osborne
f. ☐ S-100
g. ☐ Radio Shack
h. ☐ Heath/Zenith
i. ☐ TeleVideo
j. ☐ Sanyo
k. ☐ Kaypro
l. ☐ Compaq
m. ☐ Morrow
n. ☐ Columbia
o. ☐ ____________
p. ☐ PC-compat.

D. Interested in which software?
a. ☐ Word processing
b. ☐ Accounting
c. ☐ Communications
d. ☐ Data base mgmt.
e. ☐ Medical/Dental
f. ☐ Financial planning
g. ☐ Other vertical
h. ☐ Scientific

E. Interested in which products?
a. ☐ Printers
b. ☐ Modems
c. ☐ Hard disks
d. ☐ Publications
e. ☐ Information services
f. Other: ____________

F. Where do you use your computer?
1. ☐ Small business
2. ☐ Profession
3. ☐ School/training
4. ☐ Construction
5. ☐ Medium business
6. ☐ Home
7. ☐ Corporation
8. Other: ____________

G. Your immediate need?
1. ☐ Adding peripherals to present system
2. ☐ Upgrading system performance
3. ☐ Using information/communications services
4. ☐ Supplies and accessories

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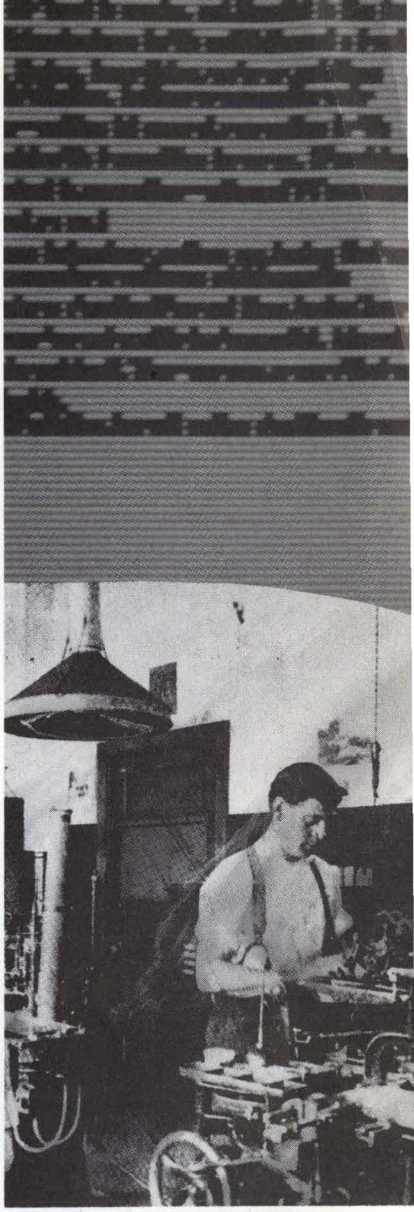

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